



[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 431

[Docket No. EERE-2013-BT-TP-0045]

RIN 1904-AD07

Energy Conservation Program: Test Procedure for Refrigerated Bottled or Canned Beverage Vending Machines

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of proposed rulemaking and public meeting.

SUMMARY: The U.S. Department of Energy (DOE) proposes to amend its test procedure for refrigerated bottled or canned beverage vending machines (BVM) in order to update the referenced method of test to ANSI/ASHRAE Standard 32.1-2010, eliminate the requirement to test at the 90 °F ambient test condition, create a provision for testing at the lowest application product temperature, and incorporate provisions to account for the impact of low power modes on measured daily energy consumption (DEC). This notice of proposed rulemaking (NOPR) also proposes several amendments and clarifications to the DOE test procedure to improve the repeatability and remove ambiguity from the current BVM test procedure. DOE will hold a public meeting to receive and discuss comments on this NOPR.

DATES: DOE will accept comments, data, and information regarding this NOPR before and after the public meeting, but no later than **[INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. See section V, “Public Participation,” for details.

DOE will hold a public meeting on Tuesday, September 16, 2014, from 9 a.m. to 4 p.m., in Washington, DC. The meeting will also be broadcast as a webinar. See section V, “Public Participation,” for webinar registration information, participant instructions, and information about the capabilities available to webinar participants.

ADDRESSES: The public meeting will be held at the U.S. Department of Energy, Forrestal Building, Room GH-019, 1000 Independence Avenue, SW., Washington, DC 20585. To attend, please notify Ms. Brenda Edwards at (202) 586–2945. Persons can attend the public meeting via webinar. For more information, refer to the Public Participation section near the end of this notice.

Comments may be submitted using any of the following methods:

1. Federal eRulemaking Portal: www.regulations.gov. Follow the instructions for submitting comments.
2. Email: BVM2013TP0045@ee.doe.gov. Include the docket number and/or RIN in the subject line of the message.

3. Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. If possible, please submit all items on a CD. It is not necessary to include printed copies.
4. Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC, 20024. Telephone: (202) 586-2945. If possible, please submit all items on a CD. It is not necessary to include printed copies.

For detailed instructions on submitting comments and additional information on the rulemaking process, see section V of this document (Public Participation).

Docket: The docket, which includes Federal Register notices, public meeting attendee lists and transcripts, comments, and other supporting documents/materials, is available for review at [regulations.gov](http://www.regulations.gov). All documents in the docket are listed in the [regulations.gov](http://www.regulations.gov) index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

A link to the docket webpage can be found at:
http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/24. This webpage will contain a link to the docket for this notice on the [regulations.gov](http://www.regulations.gov) site. The [regulations.gov](http://www.regulations.gov) webpage will contain simple instructions on how to access all documents, including Federal Register notices, public meeting attendee lists and transcripts, comments, and

other supporting documents/materials. See section V for information on how to submit comments through [regulations.gov](https://www.regulations.gov).

For further information on how to submit a comment, review other public comments and the docket, or participate in the public meeting, contact Ms. Brenda Edwards at (202) 586-2945 or by email: Brenda.Edwards@ee.doe.gov.

FOR FURTHER INFORMATION CONTACT:

Ms. Ashley Armstrong, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies, EE-5B, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-6590, Email: refrigerated_beverage_vending_machines@ee.doe.gov.

In the Office of General Counsel, contact Ms. Sarah Butler, U.S. Department of Energy, Office of General Counsel, GC-71, 1000 Independence Avenue, SW., Washington, DC 20585-0121, (202) 586-1777, Email: Sarah.Butler@hq.doe.gov

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I. Authority and Background

A. Authority

Title III, Part B¹ of the Energy Policy and Conservation Act of 1975 (“EPCA” or “the Act”), Pub. L. 94-163 (42 U.S.C. 6291–6309, as codified) established the “Energy Conservation Program for Consumer Products Other Than Automobiles.”² As part of this program, EPCA directed DOE to prescribe energy conservation standards for refrigerated bottled or canned beverage vending machines (BVMs), which are the subject of today’s notice. (42 U.S.C. 6295(v))³

Under EPCA, the energy conservation program consists essentially of four parts: (1) testing; (2) labeling; (3) Federal energy conservation standards; and (4) certification and

¹ For editorial reasons, upon codification in the U.S. Code, Part B was redesignated Part A.

² All references to EPCA in this document refer to the statute as amended through the American Energy Manufacturing Technical Corrections Act (AEMTCA), Pub. L. 112-210 (Dec. 18, 2012).

³ Because Congress included BVMs in Part A of Title III of EPCA, the consumer product provisions of Part A (not the industrial equipment provisions of Part A-1) apply to BVMs. DOE placed the regulatory requirements specific to BVMs in Title 10 of the Code of Federal Regulations (CFR), part 431, “Energy Efficiency Program for Certain Commercial and Industrial Equipment” as a matter of administrative convenience based on their type and will refer to BVMs as “equipment” throughout this document because of their placement in 10 CFR part 431. Despite the placement of BVMs in 10 CFR part 431, the relevant provisions of Title A of EPCA and 10 CFR part 430, which are applicable to all product types specified in Title A of EPCA, are applicable to BVMs. See 74 FR 44914, 44917 (Aug. 31, 2009). DOE proposes to amend 10 CFR 431.291 to clarify this point by specifying that the regulatory provisions of 10 CFR 430.33 and 430.34 and subparts D and E of 10 CFR part 430 are applicable to BVMs. DOE notes that, because the procedures in Parts 430 and 431 for petitioning the Department for and obtaining a test procedure waiver are substantively the same (79 FR 26591, 26601 (May 9, 2014)) the regulations for applying for a test procedure waiver for BVMs are those found at 10 CFR 431.401 rather than those found at 430.27.

enforcement procedures. Subject to certain criteria and conditions, DOE is required to develop test procedures to measure the energy efficiency, energy use, or estimated annual operating cost of each covered equipment type. (42 U.S.C. 6293) Manufacturers of covered equipment must use the prescribed DOE test procedure as the basis for certifying to DOE that their equipment complies with the applicable energy conservation standards adopted under EPCA, and when making representations about the efficiency of the equipment. (42 U.S.C. 6293(c) and 6295(s)) Similarly, DOE must use these test procedures to determine whether the equipment complies with any relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

General Test Procedure Rulemaking Process

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered equipment, including beverage vending machines. EPCA provides in relevant part that any test procedures prescribed or amended under this section shall be reasonably designed to produce test results which measure energy efficiency, energy use, or estimated annual operating cost of a covered unit of equipment during a representative average use cycle or period of use and shall not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In addition, if DOE determines that a test procedure amendment is warranted, it must publish proposed test procedures and offer the public an opportunity to present oral and written comments on them. (42 U.S.C. 6293(b)(2)) Finally, in any rulemaking to amend a test procedure, DOE must determine to what extent, if any, the proposed test procedure would alter the measured energy efficiency or measured energy use of any covered unit of equipment as

determined under the existing test procedure. (42 U.S.C. 6293(e)(1)) If DOE determines that the amended test procedure would alter the measured efficiency or measured energy use of a covered product, DOE must amend the applicable energy conservation standard accordingly. (42 U.S.C. 6293(e)(2))

Under 42 U.S.C. 6293(b)(1), the Secretary of Energy (Secretary) shall review test procedures for all covered products at least once every 7 years and either amend the test procedures (if the Secretary determines that amended test procedures would more accurately or fully comply with the requirements of 42 U.S.C. 6293(b)(3)) or publish a determination in the Federal Register not to amend them. (42 U.S.C. 6293(b)(1)(A))

Pursuant to this requirement, DOE has reviewed the BVM test procedure and has determined that the test procedure could be amended to improve testing accuracy of covered refrigerated bottled or canned beverage vending machines. As such, DOE is proposing amendments to its test procedure and presents these amendments in this NOPR.

B. Background

EPCA requires the test procedures for refrigerated bottled or canned beverage vending machines to be based on American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 32.1-2004 (ANSI/ASHRAE Standard 32.1-2004), “Methods of Testing for Rating Vending Machines for Bottled, Canned or Other Sealed Beverages.” (42 U.S.C. 6293(b)(15)) In December 2006, DOE published a final rule establishing a test procedure for beverage vending machines, among other

products and equipment (the 2006 BVM test procedure final rule). 71 FR 71340, 71355 (Dec. 8, 2006). In that final rule, consistent with 42 U.S.C. 6293(b)(15), DOE adopted ANSI/ASHRAE Standard 32.1-2004 as the DOE test procedure, with a modification to ANSI/ASHRAE Standard 32.1-2004 to test equipment with dual nameplate voltages at the lower of the two voltages only. 71 FR 71355 (Dec. 8, 2006).

ANSI/ASHRAE Standard 32.1-2004 specifies a method for determining the capacity of vending machines, referred to as “vendible capacity,” which essentially consists of the maximum number of standard sealed beverages a vending machine can hold for sale. In the 2006 BVM test procedure final rule, however, DOE adopted the “refrigerated volume” measure in section 5.2, “Refrigerated Volume Calculation,” of ANSI/Association of Home Appliance Manufacturers (AHAM) HRF-1-2004 (ANSI/AHAM HRF-1-2004) in addition to the “vendible capacity” measure, as referred to in ANSI/ASHRAE Standard 32.1-2004. 71 FR 71355 (Dec. 8, 2006). DOE adopted “refrigerated volume” as the primary measure of capacity for refrigerated bottled or canned beverage vending machines because of the variety of dispensing mechanisms and storage arrangements among similar machines that may lead to potentially different refrigerated volumes for different machines with the same vendible capacity. In addition, EPCA has historically used upper limits on energy use as a function of volume for the purposes of establishing energy conservation standards for refrigeration equipment. Id.

In the 2006 BVM test procedure final rule, DOE determined that section 5.2 of ANSI/AHAM HRF-1-2004, which addresses the measurement of refrigerated volume in household freezers, is also applicable to beverage vending machines and is more appropriate than

the language for measurement of volume in household refrigerators of section 4.2 of ANSI/AHAM HRF-1-2004. Specifically, section 5.2 of ANSI/ASHRAE Standard 32.1-2004 includes provisions for specific compartments and features that are typically found in refrigerated bottled or canned beverage vending machines, similar to what is found in freezers. Therefore, DOE adopted “refrigerated volume” in lieu of “vendible capacity” as the dimensional metric for beverage vending machines in the 2006 BVM test procedure final rule. Id.

Since the publication of the 2006 BVM test procedure final rule, ASHRAE has published an update to the ANSI/ASHRAE Standard 32.1 test procedure. The most recent version is ANSI/ASHRAE Standard 32.1-2010, which includes changes aligning it with the nomenclature and methodology used in the 2006 BVM test procedure final rule (71 FR 71355 (Dec. 8, 2006)) and the 2009 BVM energy conservation standards final rule (74 FR 44914 (Aug. 31, 2009)). ANSI/ASHRAE Standard 32.1-2010 removes the definitions of “bottled” and “canned” and includes the portions of ANSI/AHAM HRF-1-2004 that were incorporated by reference in the 2006 BVM test procedure final rule, in a new Appendix C for measuring refrigerated volume. DOE believes that the aforementioned changes are largely editorial and do not affect the method of test or measured energy consumption values of any covered equipment.

AHAM has also updated its HRF-1 test standard since the publication of the 2006 BVM test procedure final rule. The most recent version, AHAM HRF-1-2008, includes changes to the refrigerated volume measurement portion of the standard, reorganizes some sections for simplicity and usability, and combines the sections for the measurement of refrigerated volume of refrigerators and the measurement of the refrigerated volume of freezers.

II. Summary of the Proposed Rule

DOE is proposing to amend its test procedure for refrigerated bottled or canned beverage vending machines to update and clarify the test procedure. Specifically, DOE proposes to (1) update the referenced method of test to ANSI/ASHRAE Standard 32.1-2010; (2) eliminate the requirement to test at the 90 °F ambient test condition; (3) clarify the test procedure for combination vending machines; (4) clarify the requirements for loading of BVM models under the DOE test procedure; (5) specify the characteristics of a standard test package; (6) clarify the average next-to-vend beverage temperature test condition; (7) provide a definition of “fully cooled;” (8) specify placement of thermocouples during the DOE test procedure; (9) establish provisions for testing at the lowest application product temperature; (10) clarify the certification and reporting requirements for covered beverage vending machines; and (11) clarify the treatment of certain accessories during the DOE test procedure. These proposed clarifications and amendments would be effective 30 days after the publication of a final rule amending the BVM test procedure in the Federal Register. The clarified BVM test procedure will be placed in a new appendix, Appendix A to subpart Q of 10 CFR part 431. Manufacturers will be required to use Appendix A to demonstrate compliance with existing energy conservation standards for beverage vending machines.

In addition, this test procedure NOPR proposes amendments that are intended to be used with the promulgation of any amended energy conservation standards for refrigerated beverage

vending machines and will be included as a new Appendix B to subpart Q of 10 CFR 431. These amendments include incorporating provisions to account for the impact of low power modes .

Manufacturers would be required to use any amended test procedure adopted in Appendix B to be in compliance with DOE's energy conservation standards, as well as for labeling or other representations as to the energy use of any covered equipment, beginning on the compliance date of any final rule establishing amended energy conservation standards for refrigerated bottled or canned beverage vending machines that are set based on the amended test procedure. The ongoing BVM energy conservation standards rulemaking will use any amendments established as part of this test procedure rulemaking in its energy conservation standards analyses and, therefore, use of the test procedures established in Appendix B would be required on the compliance date of the amended energy conservation standards promulgated as a result of that rulemaking (Docket No. EERE-2013-BT-STD-0022). Prior to the compliance date of any such amended standards, manufacturers must continue to use the test procedure found in Appendix A to show compliance with existing DOE energy conservation standards and for representations concerning the energy use of covered equipment. However, manufacturers may elect to use the amended BVM test procedure in Appendix B established as a result of this rulemaking prior to its compliance date to demonstrate compliance with any future, amended standards. Manufacturers who choose to use the amended test procedure early must ensure that their equipment satisfies any applicable amended energy conservation standards. In other words, manufacturers may elect to use the amended test procedure only if they also elect to comply with the amended energy conservation standards prior to the established compliance date.

Finally, DOE is proposing amendments to 10 CFR 429.52(b) with regards to reporting requirements, including a clarifying amendment that the standard for refrigerated bottled or canned beverage vending machines is based on DEC. DOE is also proposing similar clarifying amendments to the energy conservation standards found in 10 CFR 431.296.

III. Discussion

In this NOPR, DOE is proposing several minor amendments to clarify DOE's test procedure for refrigerated bottled or canned beverage vending machines. DOE is also proposing several amendments related to the impact of low power modes. To make clear the applicability of these amendments, DOE is proposing to reorganize the existing DOE test procedure into two new appendices, Appendix A and Appendix B, to 10 CFR 431.294.

Appendix A would contain the provisions established in the 2006 BVM test procedure final rule and any clarifying amendments proposed in this NOPR. Appendix A would be used beginning 30 days after publication of the final rule in the Federal Register until the compliance date of any amended standards.

The proposed amendments found in Appendix A are discussed in Section III.A and include provisions in the following areas:

- 1) updating the referenced method of test to ANSI/ASHRAE Standard 32.1-2010;
- 2) eliminating testing at the 90 °F ambient test condition;
- 3) clarifying the test procedure for combination vending machines;

- 4) clarifying the requirements for loading BVM models under the DOE test procedure;
- 5) clarifying the specifications of the test package;
- 6) clarifying the next-to-vend beverage temperature test condition;
- 7) providing a definition for “fully cooled;”
- 8) specifying placement of thermocouples during the DOE test procedure;
- 9) establishing testing provisions at the lowest application product temperature;
- 10) clarifying certification and reporting requirements; and
- 11) clarifying the treatment of certain accessories when conducting the DOE test procedure.

Appendix B would include all of the amendments proposed in Appendix A and, in addition, provisions for testing low power modes. The test procedures found in Appendix B would be used in conjunction with any amended standards set as a result of the ongoing BVM energy conservation standard rulemaking (Docket No. EERE-2013-BT-STD-0022). Section III.B summarizes the proposed revisions to the test procedure that would be included in the amended test procedure in Appendix B.

As part of the current rulemaking on the energy conservation standards for refrigerated beverage vending machines, DOE held a public meeting on June 20, 2013, to present its Framework document (www.regulations.gov/#!documentDetail;D=EERE-2013-BT-STD-0022-0001) and to receive comments from interested parties.

In formulating today's NOPR, DOE considered the comments received in response to the Framework document and incorporated recommendations, where appropriate, that applied to the test procedure. Where applicable, comments received in response to the BVM Framework document that addressed DOE's proposed test procedure amendments are presented in sections III.A and III.B, along with DOE's response and justification.

In addition, DOE provides amendments to 10 CFR part 429, "Certification, Compliance, and Enforcement for Consumer Products and Commercial and Industrial Equipment," and part 431, subpart Q, "Refrigerated Bottled or Canned Beverage Vending Machines."

A. Minor Clarifications and Amendments to the DOE Test Procedure

DOE held a public meeting on June 20, 2013, to present its Framework document and to receive comments from interested parties. In reviewing these comments and considering revisions to DOE's test procedure for beverage vending machines, DOE determined that there are several provisions of the DOE test procedure that may require clarification. In order to clarify the Department's test procedures, DOE proposes to amend subpart Q of 10 CFR part 431 by moving most of the existing test procedures for refrigerated bottled or canned beverage vending machines from 10 CFR 431.294 to a new Appendix A to subpart Q of 10 CFR part 431. In Appendix A, DOE also proposes to incorporate nine amendments to clarify and update the current DOE test procedure for beverage vending machines. These clarifications and amendments therefore would be effective 30 days after publication of a final rule in the Federal

Register. This section of the NOPR discusses the specific test procedure provisions that require clarification, DOE's proposed amendments, and the comments received on these topics.

1. Updating the Referenced Method of Test

The current DOE test procedure for refrigerated beverage vending machines incorporates by reference two industry test procedures, ANSI/ASHRAE Standard 32.1-2004 and ANSI/AHAM HRF-1-2004, which established a method of testing for beverage vending machines and a method for determining refrigerated volume, respectively. Each of these industry test procedures has been updated since the publication of the DOE test procedure in 2006. The most current versions are ANSI/ASHRAE Standard 32.1-2010 and AHAM HRF-1-2008.

ANSI/ASHRAE Standard 32.1-2010 was amended from the 2004 version to include new definitions and nomenclature established by DOE in the 2009 BVM final rule. These changes include removing references to specific sealed-bottle package designs such as “bottled” or “canned,” revising the scope, and incorporating a new Appendix C, “Measurement of Volume,” which consists of certain portions of ANSI/AHAM HRF-1-2004 for measuring the refrigerated volume. Specifically, ANSI/ASHRAE Standard 32.1-2004 incorporated the portions of ANSI/AHAM HRF-1-2004 currently referenced in the DOE test procedure, section 5.2 (excluding subsections 5.2.2.2 through 5.2.2.4), which describes the method for determining refrigerated volume for residential freezers, as well as section 5.1, which describes the purpose of the section. These new amendments make the ANSI/ASHRAE Standard 32.1-2010 test procedure identical to the DOE test procedure established in the 2006 BVM test procedure final rule. As the amendments to ANSI/ASHRAE Standard 32.1-2010 are primarily editorial, they do

not affect the tested DEC of covered equipment. DOE is proposing to update the industry test method incorporated by reference to ANSI/ASHRAE Standard 32.1-2010 for the measurement of DEC and vendible capacity.

In the 2013 BVM Framework document, DOE requested comment regarding adoption of an updated test procedure for refrigerated bottled or canned beverage vending machines. During the comment period, DOE received no opposing comments to this proposal. Royal Vendors, Inc. (Royal) and the National Automatic Merchandising Association (NAMA) commented in support of updating the DOE test procedure to reference ANSI/ASHRAE Standard 32.1-2010. (Royal, No. 11 at p. 3;⁴ NAMA, No. 8 at p. 2) Automated Merchandising Systems, Inc. (AMS) commented that it had no objection to the use of the ANSI/ASHRAE Standard 32.1-2010 standard. (AMS, No. 17 at p. 1) Royal and NAMA commented that the test procedure should use ANSI-approved technical standards because deviations from portions of standards create confusion regarding clarity of test results, create an unfair advantage for underperforming models and manufacturers, and create potential for confusion among consumers attempting to understand and compare the tested performance of different BVM models. (Royal, No. 11 at p. 4; and NAMA, No.8 at p. 3) Royal also commented that any changes made to the test procedure should be within the confines of the ASHRAE standard because that standard is established from a consensus process and reliance on it will prevent confusion from varying test standards. (Royal No. 7 at p. 31)

⁴ A notation in this form provides a reference for information that is in the docket of DOE's rulemaking to develop test procedures for beverage vending machines (Docket No. EERE-2013-BT-STD-0022, which is maintained at www.regulations.gov). This particular notation refers to a comment: (1) submitted by Royal Vendors, Inc.; (2) appearing in document number 11 of the docket; and (3) appearing on page 3 of that document.

EPCA requires the test procedures for refrigerated bottled or canned beverage vending machines to be based on ANSI/ASHRAE Standard 32.1-2004. (42 U.S.C. 6293(b)(15)) In addition, EPCA requires DOE to develop test procedures that represent an average energy use cycle or period of use. (42 U.S.C. 6293(b)(3)) When an industry test procedure does not adequately represent the energy use of a covered unit of equipment under a representative cycle of use, DOE has the authority to amend the test procedure with respect to that covered equipment type if DOE determines that the amended test procedure would more accurately or fully reflect the representative use of that product, without being unduly burdensome. (42 U.S.C. 6293(b)(1)) DOE believes that certain amendments are necessary to adequately characterize the energy use of covered BVM models, as discussed in section III.B.

Since DOE published the 2006 BVM test procedure final rule, AHAM has released a new version of the AHAM HRF-1 test method, which reorganizes and simplifies the test method as presented in ANSI/AHAM HRF-1-2004. The revised AHAM HRF-1 test method, ANSI/AHAM HRF-1-2008, combines sections 4, 5, and 6, which relate to measuring the refrigerated volume of refrigerators and freezers, into one section describing methods for determining the refrigerated volume of refrigerators, refrigerator-freezers, wine chillers, and freezers. This unified and simplified method includes several changes regarding the inclusion or exclusion of certain special features from the determination of refrigerated volume such that DOE believes AHAM HRF-1-2008 has the potential to yield refrigerated volume values that differ slightly from those taken using the method in the current DOE test procedure. DOE considered proposing to adopt AHAM HRF-1-2008 as the method for computing refrigerated volume in the amended test procedure. DOE does not believe, however, that the updated AHAM HRF-1-2008 test procedure

has sufficient additional merit compared to the volume calculation method included in ANSI/ASHRAE Standard 32.1-2010 to justify the additional burden on manufacturers. Instead, DOE proposes to adopt Appendix C of ANSI/ASHRAE Standard 32.1-2010 as the volume measurement methodology in its amended test procedure. Adopting Appendix C of ANSI/ASHRAE Standard 32.1-2010 will allow manufacturers to reference a single document containing all information needed to conduct the DOE test procedure. As such, DOE proposes to remove ANSI/AHAM HRF-1-2004 from the documents incorporated by reference in 10 CFR 431.293.

In response to the 2013 BVM Framework document, AMS commented that the AHAM volume calculation is difficult to evaluate for its type of equipment. (AMS, No. 7 at p. 79) DOE understands AMS's comment, but notes that the determination of volume must be consistent for all covered equipment to allow for comparability and consistent application of the standards across equipment. DOE notes that if the method for determining refrigerated volume is inappropriate or impossible for any BVM basic models, the manufacturer of that equipment should request a waiver in accordance with the provisions in subpart V to 10 CFR part 431. Any petitioner for a waiver of a test procedure should note why the volume calculation in the DOE test procedure cannot be applied and include any alternate test procedure known to the petitioner. See section 431.401 of 10 CFR part 431 for the requirements of submitting petitions for waiver of test procedures.⁵

⁵ DOE recently issued a final rule amending its regulations governing petitions for waiver and interim waiver from DOE test procedures for consumer products and commercial and industrial equipment. 79 FR 26591 (May 9, 2014). This final rule carries an effective date of June 9, 2014.

DOE requests comment on the proposal to update its test procedure to incorporate by reference ANSI/ASHRAE Standard 32.1-2010.

DOE requests comment on its proposal to update the referenced method of test for the measurement of refrigerated volume in its test procedure from section 5 of ANSI/AHAM HRF-1-2004 to Appendix C of ANSI/ASHRAE 3.1-2010.

DOE requests comment on whether the methodology in Appendix C of ANSI/ASHRAE Standard 32.1-2010 for the measurement of refrigerated volume is more appropriate for beverage vending machines than the methodology outlined in section 4 of AHAM HRF-1-2008.

2. Eliminating Testing at the 90 °F Ambient Test Condition

Both ANSI/ASHRAE Standard 32.1-2004, the test method incorporated by reference in the current DOE test procedure, and ANSI/ASHRAE Standard 32.1-2010, the test method DOE proposes to incorporate by reference in the amended test procedure as discussed in section III.A.1, specify two tests: one at an ambient condition of 75 °F \pm 2°F temperature and 45 percent \pm 5 percent relative humidity (“the 75 °F ambient test condition”), and the other at an ambient condition of 90 °F \pm 2 °F temperature and 65 percent \pm 5 percent relative humidity (“the 90 °F ambient test condition”). By incorporating by reference ANSI/ASHRAE Standard 32.1-2004, DOE’s current test procedure for refrigerated beverage vending machines requires testing at both the 75 °F ambient test condition and 90 °F ambient test condition. In the energy conservation standards rulemaking that culminated in the 2009 BVM final rule, however, DOE determined to use only the 75 °F ambient test condition for the purposes of demonstrating compliance with

applicable energy conservation standards. The data taken at the 90 °F ambient test condition are not used for DOE regulatory purposes. 74 FR 44914, 44920 (Aug. 31, 2009).

In the 2013 BVM Framework document, DOE requested comment on eliminating the requirement to test units at the 90 °F ambient test condition. NAMA and Royal agreed with the elimination of the test method using the 90 °F ambient test condition. (NAMA, No. 8 at p. 2; Royal, No. 11 at p. 3) AMS and the Wittern Group, Inc. (Wittern) agreed with the elimination of the requirement to test at 90 °F ambient test condition. (AMS, No. 17 at p. 2; Wittern, No. 16 at p. 2) Wittern added that it did not see any benefit in rating machines at two temperatures and that the change would benefit the consumer by making it easier to compare machines. (Wittern, No. 16 at p. 2)

The California Investor-Owned Utilities (CA IOUs) opposed the complete elimination of the methodology used to measure performance at the 90 °F ambient test condition, stating that the 90 °F ambient test condition better evaluates the performance of equipment installed outdoors and requested that DOE maintain it for Class B equipment.⁶ (CA IOUs, No. 19 at pp. 4 and 5) The CA IOUs further requested that the Class B equipment MDEC at the 90 °F ambient test condition be included in DOE's Compliance Certification Database because such information would be useful to consumers and purchasers of Class B units to be installed in

⁶ DOE defines a Class B refrigerated bottled or canned beverage vending machine to mean any refrigerated bottled or canned beverage vending machine not considered to be Class A, and is not a combination vending machine. DOE defines a Class A refrigerated bottled or canned beverage vending machine as any refrigerated bottled or canned beverage vending machine that is fully cooled and is not a combination vending machine. (See 10 CFR 431.292) Class B refrigerated bottled or canned beverage vending machines are, therefore, not fully-cooled machines and are typically referred to in the industry as "zone-cooled." DOE found in its preliminary analysis for the concurrent energy conservation standards rulemaking that class B machines are often installed outside (DOE estimates that about 25% are installed outside), whereas Class A machines are rarely, if ever, installed outside.

outdoor settings. (CA IOUs, No. 19 at p. 5) The Joint Comment⁷ encouraged DOE to maintain the requirement to test Class B units at 90 °F because the 75 °F ambient test may not adequately reflect the performance of units installed outdoors and noted that performance at high ambient temperatures may become a more significant issue with the increased adoption of alternative refrigerants. (Joint Comment, No. 13 at p. 1) The Joint Comment encouraged DOE to maintain the 90 °F ambient test condition for Class B machines and require the associated MDEC to be reported and included in the Compliance Certification Database for the use of customers purchasing units to be installed outdoors and energy efficiency program managers. (Joint Comment, No. 13 at p. 2)

The CA IOUs also commented that it assumes manufacturers are continuing to test at the 90 °F ambient test condition, which remains in ANSI/ASHRAE Standard 32.1, to satisfy the requirements of the industry-developed test procedure and to understand how their equipment performs at these conditions. Therefore, according to the CA IOUs, there would be little additional test burden created by continuing to require testing at the 90 °F ambient condition in the DOE test procedure because manufacturers will already be testing at 90 °F for industry purposes. (CA IOUs, No. 19 at p. 5) Finally, the CA IOUs submitted to DOE two reports prepared by testing laboratories at Southern California Edison to further DOE's understanding of the effect of ambient temperature on BVM energy use, and further commented that energy use was increased by almost 25 percent for an opaque door machine and almost 50 percent for a transparent door unit tested at a higher ambient temperature. (CA IOUs, No. 19 at p. 5)

⁷ Joint Comment refers to the written comment submitted by the Appliance Standards Awareness Project, the Alliance to Save Energy, the American Council for an Energy-Efficient Economy, Natural Resources Defense Council, Northeast Energy Efficiency Partnerships, Northwest Energy Efficiency Alliance, and the Northwest Power and Conservation Council in Docket No. EERE-2013-BT-STD-0022.

DOE is proposing to amend its test procedure to eliminate the requirement to perform a test at the 90 °F ambient test condition as described in ANSI/ASHRAE Standard 32.1-2004 and ANSI/ASHRAE Standard 32.1-2010. DOE understands that the 90 °F test is used primarily to represent and evaluate the performance of some units that may be installed outdoors; however, as mentioned above, the performance of a beverage vending machine at the 90 °F ambient test condition is not currently used for DOE regulatory purposes and is not required to be reported to demonstrate compliance of covered equipment. Therefore, DOE does not see a need to maintain the 90 °F test condition as part of the DOE test procedure.

In response to the Joint Comment's concern regarding increasing use of alternative refrigerants, DOE acknowledges that equipment with carbon dioxide refrigerant, which have recently become available in the U.S. market, may in general have significantly different energy performance characteristics at the 90 °F ambient test condition when compared to machines with hydrofluorocarbon (HFC) refrigerants such as HFC-134a. However, as conditions above 75 °F and conditions below 75 °F are equally representative of conditions encountered by equipment installed in the United States, DOE maintains that the 75 °F ambient test condition is a suitable rating condition and represents the average use cycle of the equipment.

DOE believes removing the 90 °F ambient test condition test requirement will reduce manufacturer burden associated with its test procedure by eliminating testing that does not significantly increase the accuracy or representativeness of the DOE test procedure and is unnecessary for demonstrating compliance with DOE's energy conservation standards.

DOE requests comment on its proposal to eliminate the requirement to conduct testing at the 90 °F ambient test condition.

3. Test Procedure for Combination Vending Machines

In the 2013 BVM Framework document, DOE requested comment regarding the use of the current DOE test procedure to evaluate the energy use of combination vending machines. In response to the Framework document, DOE received several comments regarding the development of a test procedure for combination vending machines. AMS commented that it manufactures combination machines in a variety of different configurations and that testing these configured as Class A machines, if the machine design allows, would result in the highest energy consumption possible for the model. AMS added that, for combination vending machines tested configured as Class A machines, the current DOE test procedure and MDEC for Class A machines can be applied without any loss of program integrity. (AMS, No. 17 at p. 4) NAMA commented that machines currently classified under the regulations as refrigerated can and bottle vending machines are inherently different than combination machines, which, unlike traditional can and bottle vending machines, are in most cases designed to dispense perishable products and food items in countless machine configurations. (NAMA, No. 8 at p. 5) The CA IOUs commented that DOE should consider updates to the test procedure to accurately measure the efficiency of combination machines. (CA IOUs, No. 19 at p. 3) Wittern commented that combination vending machines can be part of Class A if they are tested in the worst case condition, fully cooling the refrigerated compartment, since the machine is not going to consume more energy when it is only partially cooling the compartment. (Wittern, No. 16. at p. 2)

Based on the comments received, DOE has determined that there may be confusion about what constitutes a combination vending machine for the purposes of DOE's energy conservation standards. To clarify, DOE notes that a combination vending machine is defined as a refrigerated bottled or canned beverage vending machine that also has non-refrigerated volumes for the purpose of vending other, non-"sealed beverage" merchandise. 10 CFR 431.292 Based on this definition, any machine (a) that upon payment dispenses beverages in sealed containers and (b) in which the entire internal storage volume is refrigerated, is not a combination vending machine. For example, a piece of equipment that is designed to vend sealed beverages and other products with an entirely refrigerated internal storage volume, would be a covered Class A refrigerated beverage vending machine and should be tested accordingly. Such equipment would be a covered Class A beverage vending machine even if the portions of the machine that vend sealed beverages and other products are physically separated, provided they are both refrigerated.

Regarding the test procedure for combination vending machines, DOE believes that its current test procedure is appropriate for the evaluation of the refrigerated volume, vendible capacity, and energy use of combination vending machines. Similarly, DOE believes the amendments to the BVM test procedure proposed in this NOPR are equally applicable to combination vending machines. DOE notes, however, that the application of the BVM test procedure may require clarification as to how it is applied to combination vending machines. For example, in combination vending machines, only the refrigerated compartment would be evaluated in the refrigerated volume calculation, while the vendible capacity would be that of both refrigerated and non-refrigerated compartments. The non-refrigerated compartment would

not be accounted for in the refrigerated volume determination. Similarly, standard test packages would be placed in the next-to-vend position only in the refrigerated portion of the refrigerated beverage vending machine and only the refrigerated portion of the combination vending machine would be required to be fully loaded to capacity. However, any lighting or other energy-consuming features in the non-refrigerated compartment would be fully energized during the test procedure and operated in the same manner as any lighting or features in the refrigerated compartment (see section III.A.11.b and III.B.1). Therefore, the total energy use of the machine during the 24-hour test would comprise the DEC, as measured in accordance with ANSI/ASHRAE Standard 32.1-2004 or ANSI/ASHRAE Standard 32.1-2010. DOE proposes to add these clarifications to the DOE test procedure at 10 CFR 431.294 for combination vending machines.

DOE requests comment on the applicability of the existing test procedure, as clarified, to combination vending machines.

4. Loading of BVM Models When Conducting the DOE Test Procedure

In reviewing the current test procedure for refrigerated bottled or canned beverage vending machines and, in particular, in reviewing the comments submitted regarding the applicability of the BVM test procedure to combination vending machines, DOE determined that the loading requirements for Class A and Class B machines are not clearly and unambiguously specified in the current DOE test procedure. Therefore, DOE proposes to add language to the BVM test procedure to clarify the loading requirements for covered Class A and Class B refrigerated bottled or canned beverage vending machines that are offered in a variety of

configurations and may be capable of vending other refrigerated merchandise. Specifically, DOE proposes to amend the regulatory text to clarify that any Class A or Class B beverage vending machine that is available with a variety of product storage configurations should be configured, for purposes of testing, to hold the maximum number of sealed beverages that it is capable of accommodating per manufacturer specifications. For example, if some areas of the machine can be configured either to vend sealed beverages or to vend other refrigerated merchandise, the equipment should be configured and loaded with the maximum number of sealed beverages for testing. Tests conducted with other configurations may produce different results because of the decrease in thermal mass in the refrigerated space. The performance at the maximum beverage configuration may be used to represent the performance of other configurations of a basic model of covered equipment which differ in placement and type of shelving only. However, if a manufacturer wishes to make differing representations regarding the energy consumption of a refrigerated bottled or canned beverage vending machine in various shelving configurations, the manufacturer may elect to test and certify each unique shelving configuration as a separate basic model.⁸

DOE proposes to add language to the DOE test procedure in Appendix A and Appendix B to clarify the loading requirements for covered BVM models.

⁸ For purposes of BVMs, basic model means all units of a refrigerated bottled or canned beverage vending machine (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional characteristics that affect energy consumption or energy efficiency. *See* 10 CFR 431.292. If differing shelving configurations affect the energy consumption, these differing configurations should be considered different basic models.

5. Specifying the Characteristics of the Standard Product

When testing a BVM model in accordance with the DOE test procedure, the equipment is to be loaded with the maximum quantity of standard product and with standard test packages in each next-to-be-vended position for each selection, as required by section 7.2.2.1 and 7.2.2.2 of ANSI/ASHRAE Standard 32.1-2004 and 2010. Section 5 of ANSI/ASHRAE Standard 32.1-2004 and 2010 further requires that the standard product shall be 12-ounce cans for machines that are capable of dispensing 12-ounce cans. For all other machines, the standard product shall be the product specified by the manufacturer as the standard product.

The DOE test procedure does not provide any further specificity regarding the characteristics of the standard product when conducting the DOE test procedure, or the manufacture of standard test packages. DOE understands that there may be variability among manufacturers and testing laboratories with regard to the configuration of standard product and standard test packages. DOE believes that such variability may result in minor inconsistencies in test results. As such, DOE proposes to clarify the characteristics of the standard product and standard test package to ensure test results are as consistent and repeatable as possible.

In this NOPR, DOE proposes to add text to the BVM test procedure in Appendix A and Appendix B, that the standard product shall be standard 12-ounce aluminum beverage cans filled with a liquid with a density of 1.0 grams per milliliter (g/mL) \pm 0.1 g/mL at 36 °F. For refrigerated bottled or canned beverage vending machines that are not capable of holding 12-ounce cans, but are capable of vending 20-ounce bottles, the standard product shall be 20-ounce plastic bottles filled with a liquid with a density of 1.0 g/mL \pm 0.1 g/mL at 36 °F. For refrigerated

bottled or canned beverage vending machines that are not capable of holding 12-ounce cans or 20-ounce bottles, the product specified by the manufacturer as the standard product shall continue to be used.

DOE selected a density range of $1.0 \text{ g/mL} \pm 0.1 \text{ g/mL}$ as it is inclusive of most test fluids used today. For example, this density range includes water, diet and regular soda, fruit juices, and propylene glycol/water mixtures up to 50/50 percent by volume. In addition, Fischer-Nickel conducted research in 2004 comparing the temperature measurements of standard test packages constructed in the manner specified by ANSI/ASHRAE Standard 32.1, as compared to the test packages described in ASHRAE Standard 117-2002, which are 1-pint plastic test packages filled with a 50/50 mixture of water and propylene glycol, and found little variation in measured temperatures with the different test package materials and fluids.⁹

Section 3 of ASHRAE 32.1-2004 and 2010 defines the standard test package as a beverage container of the size and shape for which the vending machine is designed, altered to include a temperature-measuring instrument at its center of mass. DOE finds the requirements in ANSI/ASHRAE Standard 32.1-2004 and 2010 to be fairly clear and concise, when paired with the clarification above regarding the standard product. And, as such, DOE is not proposing additional clarifications beyond the proposed clarification that the standard product shall be 12-ounce cans or 20-ounce bottles, for BVM models that are capable of holding cans or bottles, respectively, filled with a liquid with a density of $1.0 \text{ g/mL} \pm 0.1 \text{ g/mL}$ at 36 °F.

⁹ Cowen, D. and Zabrowski, D. 2004. "Application and Evaluation of ASHRAE 117-2002 and ASHRAE 32.1-1997." FSTC Report # 5011.04.01. Fischer-Nickel, Inc. Available at: http://www.fishnick.com/publications/appliancereports/refrigeration/Application_of_ASHRAE_117_and_32.1.pdf

DOE requests comment on the need to maintain the flexibility of specifying the standard product as that specified by the manufacturer for refrigerated bottled or canned beverage vending machines that are not capable of holding 12-ounce cans or 20-ounce bottles. DOE specifically requests examples of BVM models that might require this flexibility and what type of standard products they are tested with currently.

DOE requests comment on the sufficiency of the existing requirements regarding standard test packages. If the existing language is not sufficiently clear, DOE requests comments and recommendations regarding what additional clarifications might be necessary to ensure consistency and repeatability of test results.

6. Clarifying the Next-to-Vend Beverage Temperature Test Condition

ANSI/ASHRAE Standard 32.1-2004, the test method incorporated by reference in the current DOE test procedure, states, “the beverage temperature shall be measured in standard test packages in each next-to-be-vended position for each selection.” ANSI/ASHRAE Standard 32.1-2004 specifies an average next-to-vend temperature of $36^{\circ}\text{F} \pm 1^{\circ}\text{F}$ “throughout test.” The beverage temperature requirements of the ANSI/ASHRAE Standard 32.1-2010 test method, which DOE proposes to incorporate by reference into its test procedure as part of this NOPR, are identical to those of ANSI/ASHRAE Standard 32.1-2004.

DOE has become aware of a need to clarify whether the next-to-vend temperature specification of $36^{\circ}\text{F} \pm 1^{\circ}\text{F}$ “throughout test” refers to a condition in which the average next-to-

vend temperature is maintained at $36\text{ }^{\circ}\text{F} \pm 1\text{ }^{\circ}\text{F}$ constantly for the duration of the test, or one in which the temperature of next-to-vend beverages is averaged across all selections and over the entire length of the test, resulting in a single value of $36\text{ }^{\circ}\text{F} (\pm 1\text{ }^{\circ}\text{F})$.

In the 2013 BVM Framework document, DOE requested comments on its consideration of clarifying the intent of the terminology “throughout test” with regard to maintaining the average next-to-vend temperature at $36\text{ }^{\circ}\text{F} \pm 1\text{ }^{\circ}\text{F}$ in the DOE test procedure. Specifically, in the Framework document, DOE discussed clarifying the next-to-vend temperature condition as one where the average of all beverages in the next-to-vend position is maintained at $36\text{ }^{\circ}\text{F} \pm 1\text{ }^{\circ}\text{F}$ at all times throughout the test. 78 FR 33262 (June 4, 2013). In response, DOE received a variety of comments. Royal and NAMA did not support this clarification, stating that DOE should average the temperature data across all next-to-vend selections and over the entire test period because there is no evidence that variations in temperatures will impact energy use as long as the temperature is averaged for the test period. Royal and NAMA further stated that vending machines have varying defrost schemes, and the individual next-to-vend selections or their average temperature may migrate outside the $36\text{ }^{\circ}\text{F} (\pm 1\text{ }^{\circ}\text{F})$ range during defrost or other changes in refrigeration state. (Royal, No. 11 at p. 3; NAMA, No. 8 at p. 2) Royal also commented that while the current $\pm 1\text{ }^{\circ}\text{F}$ tolerance is adequate, a one-sided tolerance (allowing temperatures to go below $35\text{ }^{\circ}\text{F}$ but not above $37\text{ }^{\circ}\text{F}$) would provide more design freedom. (Royal, No. 7 at p. 53)

Additionally, Wittern commented that it contacted ASHRAE, which provided interpretations from two former ANSI/ASHRAE Standard 32.1 committee members that the temperature value to be used is the average of all test packages and not a tolerance applied to a

single test package. (Wittern, No. 16 at p. 1) Wittern further commented that the current design is that the next-to-vend beverages in stack machines are the first hit with the cold air and that maintaining the average product temperature (± 1 °F) for each product in a stack machine would require major redesign to have all beverages hit equally with the supply air. (Wittern, No. 16 at p. 1) AMS stated that holding 60 or 70 cans within ± 1 °F is nearly impossible and would mean a dramatic increase in price. (AMS, No. 17 at p. 1) AMS stated that if such a specification is deemed necessary, ± 10 °F would be more appropriate. (AMS, No. 17 at p. 1) AMS also noted that because the ANSI/ASHRAE Standard 32.1 test method specifies an accuracy of ± 1 °F for temperature measurement equipment, temperature measurements can probably only be expected to record a ± 5 °F tolerance range with reasonable certainty. (AMS, No. 17 at p. 1)

DOE acknowledges commenters' concerns that maintaining each individual beverage within a ± 1 °F tolerance is unnecessarily rigorous and is not the intent of the DOE test procedure. DOE agrees with commenters that the average next-to-vend temperature should be both a spatial and temporal average. To remove any ambiguity from this requirement, DOE is proposing to clarify its test procedure by explicitly stating that the temperature of next-to-vend beverages shall be averaged across all next-to-vend beverages and over the entire time of the test, resulting in a single value of 36 °F (± 1 °F). Specifically, DOE proposes to incorporate a definition of integrated average temperature to read as follows integrated average temperature means the average of all standard test package measurements in the next-to-vend beverage positions taken during the test, expressed in degrees Fahrenheit (°F).

This clarification aligns with the general methodology for determining the temperature of internal refrigerated volumes for commercial refrigeration equipment and, as such, should be understood by the BVM industry to be a time-averaged value.

DOE requests comment on its proposed definition of “integrated average temperature” for beverage vending machines.

DOE requests comment on whether the proposed definition for “integrated average temperature” aligns with standard practice in industry, and whether any manufacturers have instead been maintaining the 36 °F (± 1 °F) next-to-vend temperature constantly throughout the test used for DOE certification.

7. Defining “Fully Cooled”

The 2009 BVM final rule established DOE energy conservation standards for beverage vending machines in two equipment classes: Class A and Class B refrigerated beverage vending machines. 74 FR 44914, 44968 (Aug. 31, 2009). The distinguishing criterion between these two equipment classes is whether or not equipment is fully cooled. 10 CFR 431.292.

DOE regulations, however, have never included a definition for the term “fully cooled.” In the 2013 BVM Framework document, DOE included a suggested definition for consideration and comment. The definition under consideration for fully cooled beverage in the 2013 BVM Framework document means a refrigerated bottled or canned beverage vending machine within

which each item in the beverage vending machine is brought to and stored at temperatures that fall within ± 2 °F of the average beverage temperature, which is the average of the temperatures of all the items in the next-to-vend position for each selection.

DOE received comments regarding the definition of “fully cooled” in response to the 2013 BVM Framework document. AMS commented that the strict temperature control (± 2 °F) proposed in the framework definition is not practical, and probably impossible to achieve, and that temperatures vary widely, possibly as much as ± 10 °F, from front to rear and top to bottom in today’s machines. (AMS, No. 17 at p. 6) AMS agreed with the rationale of the proposal, but stated that data taken from products not in the next-to-vend positions should only be used to determine whether such products are being cooled, without a strict temperature restriction. (AMS, No. 17 at p. 6) AMS suggested that if such products are at least 20 °F below the ambient temperature, the machine should be considered fully cooled. (AMS, No. 17 at p. 2) AMS suggested that plus or minus six degrees might be a more appropriate range. (AMS, No. 7 at p. 51) AMS went on to say that it understood the current definition of “fully cooled” as meaning that the machine’s inherent design is based on an attempt to equally cool all products within the machine and thought that this is generally the interpretation used by the rest of the industry as well. (AMS, No. 17 at p. 6)

Wittern commented that its opaque-front beverage machines are zone-cooled for the most part, and that it believes the current equipment classes could be simplified to glass fronts with trays for Class A and closed fronts with stacks for Class B. (Wittern, No. 16 at p. 2)

Royal proposed to define a fully cooled vending machine as one in which the average temperature of all items in the next-to-vend position is within ± 1 °F during the 24-hour test period as defined in ANSI/ASHRAE Standard 32.1-2010. (Royal, No. 11 at p. 7) Royal also commented that DOE should stay within established and approved standards for definition purposes, rather than trying to define new standards and classifications. (Royal, No. 5 at p. 50) NAMA stated that they agreed with the current definition of “fully cooled vending machine” as they believe is specified in ANSI/ASHRAE Standard 32.1-2010. (NAMA, No. 8 at p. 8) AMS agreed that a definition of fully cooled based on average next-to-vend temperatures across the face of the machine would be better than a temperature band for each beverage. (AMS, No. 17 at p. 57)

The CA IOUs stated DOE should consider including a definition for zone-cooled if it is used in the definition of Class B equipment. (CA IOUs, No. 19 at p. 2) The CA IOUs requested that DOE work to establish a more descriptive definition of Class B equipment that describes them as what they are, which the CA IOUs understand to be zone-cooled, rather than by what they are not, to prevent confusion for marketplace actors who may not be familiar with the equipment. (CA IOUs, No. 19 at p. 2)

In light of the comments received, DOE is proposing the following definition of “fully cooled” which means a condition in which the refrigeration system of a beverage vending machine cools product throughout the entire refrigerated volume of a machine instead of being directed at a fraction (or zone) of the refrigerated volume as measured by the average

temperature of the standard test packages in the furthest from the next-to-vend positions is no more than 10 °F above the integrated average temperature of the standard test packages.

This definition is predicated upon the different methods of cooling used in Class A and Class B machines and the customer utility provided by fully cooling the refrigerated space. Maintaining all refrigerated beverages within 10 °F of the next-to-vend beverage temperature typically allows customers to select from more beverages and ensures that the customer will receive a properly cooled product, regardless of the product's vertical location in the machine. In response to NAMA's proposal to apply the current definition of "fully cooled vending machine" as found in ANSI/ASHRAE Standard 32.1-2010, DOE has reviewed ANSI/ASHRAE Standard 32.1-2010 and did not find such a definition.

As discussed earlier, DOE considered an alternative definition for fully cooled beverage vending machine. That definition would distinguish between those beverage vending machines that bring a product closer to the temperature at which it will be dispensed as it is moved closer to the next-to-vend position in the machine (i.e., zone-cooled beverage vending machines which hold the product in a vertical stack), and those units that are not designed to store products at temperatures other than the temperature at which the product will be dispensed. However, as suggested by interested parties in response to the 2013 BVM Framework Document, enforcing such a definition would require temperature measurements at each beverage location, which would be extremely burdensome to implement. In addition, requiring all beverages to be maintained at the next-to-vend temperature is an unrealistic requirement given the current designs of Class A machines. Instead, DOE is proposing temperature measurements at only the

next-to-vend and furthest from next-to-vend temperature positions. DOE believes this is a reasonable number of additional temperature measurements such that the test procedure will not be unduly burdensome to conduct, while still providing a method to verify the location cooling method employed by the given machine. In addition, DOE selected a temperature range of 10 °F, as suggested by AMS, as a reasonable temperature bound to differentiate fully cooled beverage vending machines. DOE verified this proposed temperature range based on limited testing of refrigerated bottled or canned beverage vending machines currently available on the market to determine the typical temperature variability observed between the next-to-vend and furthest from next-to-vend beverages in Class A and Class B equipment, respectively. As such, DOE is proposing a more quantitative definition of fully cooled to unambiguously differentiate Class A and Class B equipment.

DOE believes that the proposed definition of “fully cooled” accurately reflects the differences in cooling method and design between fully cooled and non-fully cooled beverage vending machines, and, further, aligns with DOE’s interpretation of fully cooled machines to date. Therefore, DOE does not anticipate that this proposal will change the equipment class or energy standard level for any equipment that is currently covered under existing standards.

Along with DOE’s proposed definition for fully cooled, DOE also proposes to adopt a new test method that can be used to quantitatively differentiate between Class A and Class B equipment. As noted by Wittern, if temperature measurements are going to be used to determine which machines are fully cooled, the measurements must come from test packages in positions other than next-to-vend, because test packages in the next-to-vend position will be at the

temperature at which they will be vended whether or not the machine is designed to equally cool all products within the machine. (Wittern, No. 16 at p. 2).

In response to the 2013 BVM Framework, DOE received several comments concerning additional temperature measurements. Wittern commented that it did not agree with the definition of “fully cooled” in the framework because it required temperature measurements of all products, which would not be practical and would be extremely costly. Wittern also commented that the average of next-to-vend beverage temperature measurements is sufficient as a baseline to ensure compliance. (Wittern, No. 16 at p. 2) AMS agreed with the rationale of additional temperature measurement requirements but argued that the data collected should only be used in a general way. (AMS, No 17 at p. 2) The CA IOUs commented that DOE should consider requiring additional thermocouples throughout the different zones of the equipment in order to verify the equipment’s cooling mechanism (fully cooled or zone-cooled), and added that DOE can refer to the test procedure for residential refrigeration equipment. (CA IOUs, No. 19 at p. 5) The Joint Comment stated that it supports additional product temperature measurements that could be used to verify a unit’s equipment class. (Joint Comment, No. 13 at p. 2)

Royal and NAMA did not support the addition of requirements of temperature measurements at locations other than the next-to-vend position because the location of such thermocouples is not specified in ANSI/ASHRAE Standard 32.1-2010 and will increase the time and cost of testing, creating undue hardship on small manufacturers by requiring them to expand their laboratory equipment and resources. (Royal, No. 11 at p. 4; NAMA, No. 8 at p. 3) NAMA also commented that all temperature measurements should continue to be made in the next-to-

vend package, focusing on the products that are conditioned for immediate sale to the consumer. (NAMA, No. 8 at p. 3) Wittern commented that it would prefer to minimize the number of thermocouples needed for the test, as it is almost maxed out on the capabilities of its data acquisition equipment. (Wittern, No. 16 at p. 2)

DOE acknowledges the comments of interested parties regarding the need for additional temperature measurements and the potential associated burden with such measurements, but notes that a quantitative and objective test method is required to unambiguously differentiate Class A and Class B equipment in cases where the appropriate categorization of equipment may not be clear. Therefore, in today's NOPR, DOE is proposing a test method to verify whether refrigerated bottled or canned beverage vending machines meet the definition of "fully cooled." The proposed test method is based on the difference between the average next-to-vend temperature and the average temperature of standard test packages placed in the furthest from next-to-vend position during the test period. Specifically, DOE proposes to amend the regulatory text to clarify that a beverage vending machine is fully cooled if the difference between these two averages is no greater than 10 °F during the test period.

DOE recognizes the comments of interested parties stating that it is difficult to establish a strict range that will be universally applicable to all types of Class A and Class B refrigerated bottled or canned beverage vending machines. Specifically, it is possible that some machines that have next-to-vend beverages stored throughout the vertical axis of the usable refrigerated space could have differences between the average next-to-vend temperature and the average furthest from next-to-vend temperature (along the horizontal axis) that are greater than any range DOE

may set. Conversely, machines that have next-to-vend beverages only in the bottom of the machine (stack machines) could have differences between the average next-to-vend temperature and the furthest from next-to-vend temperature (along the vertical access) that are less than any range DOE may set. However, DOE notes that a quantitative test is required to ensure consistent categorization among manufacturers and for appropriate application of the standards.

DOE believes that a 10 °F temperature range is sufficiently broad so that it will effectively categorize machines in which the entire refrigerated volume is fully cooled. DOE also notes that such a temperature range may encourage manufacturers of Class B, zone-cooled refrigerated bottled or canned beverage vending machines to ensure that the refrigeration system is, in fact, only cooling the bottom portion of the machine where the next-to-vend beverages are located, which is an inherently more energy efficient design. DOE does not believe a strict temperature range would create a loophole for manufacturers to modify the design of Class A machines such that the temperature requirement is not met and the equipment can be certified as a Class B machine due to the specific customer utility of fully cooled machines.

As such, DOE proposes to establish an optional test method for determining if a given refrigerated bottled or canned unit meets DOE's definition of "fully cooled" where standard test packages would be placed in representative locations furthest from each next-to-vend beverage location, in addition to every next-to-vend beverage position as is currently required. For beverage vending machines with horizontal product rows, or spirals, this would require a standard test package at the back of the horizontal product rows in the four corners of the machine (e.g., bottom right, bottom left, top right, and top left). For beverage vending machines

with standard products configured in a vertical stack, this would include an additional standard test package at the top of each stack. To determine if a given refrigerated bottled or canned beverage vending machine was fully cooled, manufacturers would determine the average temperature of the standard test packages in the furthest from the next-to-vend position over the entire test period and compare that value to the integrated average temperature of standard test packages in the next-to-vend beverage positions. If the difference between these two values is less than or equal to 10 °F, the tested unit would be considered fully cooled.

DOE notes that this test method would not be required to certify equipment but would be the method used by DOE to determine the appropriate equipment class for enforcement purposes. Therefore, DOE's proposed definition and test method would not require manufacturers to take any additional temperature measurements beyond what is currently specified in ANSI/ASHRAE Standard 32.1-2004, as incorporated, and ANSI/ASHRAE Standard 32.1-2010, as proposed. Even if manufacturers elect to perform this proposed test method for all certified BVM models, DOE does not believe this will significantly increase the burden of conducting the BVM test procedure. A detailed analysis of the incremental burden associated with the fully cooled validation procedure is included in section IV.B.

DOE requests comment on its proposed definition of "fully cooled." DOE would further appreciate comment as to whether the proposed definition aligns with the classifications of Class A and Class B equipment currently used in industry.

DOE requests comment on the proposed fully cooled validation test method. Specifically, DOE requests comment as to whether a range of 10 °F is an appropriate threshold to differentiate fully cooled equipment and any incremental burden on manufacturers associated with the optional test method for determining if a BVM model meets the definition of “fully cooled.”

8. Placement of Thermocouples During Testing

DOE has realized that there is currently a lack of specificity in the DOE test procedure regarding proper placement of thermocouple wires during testing. DOE proposes to clarify that, in order to avoid compromising the thermal integrity of the vending machine, thermocouple wires should not be run through the dispensing door. Instead, the wires should be fed through the gasket, as it will form around them and maintain a better thermal seal for the cooled compartment. As such, DOE proposes to add text to the BVM test procedure in Appendix A and Appendix B specifying that sensors shall be installed in a manner that does not affect energy performance. Specifically, DOE proposes to amend the regulatory text to require that thermocouple wires be run through the door gasket and not through the dispensing door of the beverage vending machine such that the sensor pathway is sealed to prohibit airflow between the interior refrigerated volume and the ambient room air.

9. Establishing Testing Provisions at the Lowest Application Product Temperature

DOE’s current test procedure requires that an average next-to-vent temperature of 36 °F \pm 1 °F be maintained throughout the test, as required by the energy performance test (section 7.2) in ANSI/ASHRAE Standard 32.1-2004. ANSI/ASHRAE Standard 32.1-2010 contains the same requirement. DOE is aware that certain models of beverage vending machines available on the

market are covered by DOE's test procedure and energy conservation standards, but are not designed to maintain the prescribed rating temperature, and thus cannot be tested in accordance with the DOE test procedure. Manufacturers of such equipment currently must request a test procedure waiver to comply with DOE's energy conservation standards in accordance with 10 CFR 431.401.

While DOE recognizes that the majority of covered beverage vending machines can be tested at the established rating temperature of 36 °F, DOE is aware of some unique BVM models that are designed to operate much higher than 36 °F and cannot operate at 36 °F. As such, in the 2013 BVM Framework document, DOE discussed adopting provisions for testing equipment that cannot operate at the specified next-to-vend beverage temperature at the equipment's lowest application product temperature. DOE added that, in this context, the lowest application product temperature would describe the lowest temperature at which the beverage vending machine is capable of operating and is often indicated by the lowest setting on a unit's thermostat. In response to the 2013 BVM Framework document, DOE received several comments regarding a proposed lowest application product temperature provision. Both Royal and NAMA disagreed with allowing BVM models that cannot achieve an average temperature of next-to-vend products of 36 °F (± 1 °F) to instead be tested at the lowest application product temperature, contending that test procedures should use ANSI-approved technical standards. (Royal, No. 11 at p. 3; NAMA, No. 8 at p. 3) Wittern saw no need for the lowest application product temperature provision. (Wittern, No. 16 at p. 2) AMS supported the provision as long as there is no attendant change in MDEC calculation. (AMS, No. 17 at p. 2)

DOE is proposing amendments to its test procedure for beverage vending machines to allow covered beverage vending machines that cannot achieve an average next-to-vend temperature of 36 °F (± 1 °F) to instead be tested at their lowest application product temperature. DOE believes that testing at the lowest application product temperature would best allow for the measurement of DEC of equipment that cannot maintain an average next-to-vend temperature of 36 °F (± 1 °F). The lowest application product temperature provision would be consistent with DOE's 2014 test procedure final rule for commercial refrigeration equipment, where an identical provision was adopted for commercial refrigeration equipment that could not maintain the required integrated average product temperature specified for its given equipment class. 79 FR 22277, 22297–22298, 22308 (April 21, 2014).

In the context of beverage vending machines, the lowest application product temperature would describe the lowest temperature at which a beverage vending machine model is capable of maintaining next-to-vend beverages and could correspond to the lowest setting on a unit's thermostat. For beverage vending machines that cannot maintain an average next-to-vend temperature of 36 °F (± 1 °F), the lowest application product temperature provision would specify a revised average beverage temperature for beverages in the next-to-vend position, but would not modify any other requirements of the DOE test procedure. Equipment tested and certified using the lowest application product temperature would be required to meet the standard applicable for its equipment class and refrigerated volume, and the manufacturer would be required to maintain records of the lowest application product temperature at which a given model is rated.

DOE requests comment on its proposal to adopt a lowest application product temperature provision for covered beverage vending machines that cannot be tested at the specified average next-to-vend temperature of 36 °F (± 1 °F).

DOE also requests comment on how the lowest application product temperature might be best determined for beverage vending machines and whether the lowest thermostat setting is a reasonable approach for most equipment. DOE requests comment on how to determine the lowest application product temperature for equipment without thermostats.

10. Clarifications to Certification and Reporting Requirements

DOE notes that 10 CFR 429.52(b)(2) contains requirements for certification reports for covered beverage vending machines. Specifically, DOE requires reporting of “maximum average daily energy consumption.” However, ANSI/ASHRAE Standard 32.1-2010 describes the test procedure for determining “daily energy consumption” as the measured result for a given model of beverage vending machine. To be consistent, DOE is proposing updating the reporting requirements at 10 CFR 429.52(b)(2) to reference “daily energy consumption” rather than “maximum average daily energy consumption.” DOE notes that it intends for manufacturers to include in their certification reports the measured “daily energy consumption” for each basic model of beverage vending machine. The “maximum daily energy consumption” referenced in 10 CFR 431.296 for a given model of beverage vending machine is the maximum permissible energy consumption (i.e., the energy conservation standard) level for that model, while the “daily energy consumption” is the measured energy consumption determined through the DOE test procedure. The “daily energy consumption” of a given BVM basic model measured in the DOE

test procedure and reported in accordance with 10 CFR 429.52(b)(2) should be compared to the “maximum daily energy consumption” for the basic model’s respective equipment class in the standard table in 10 CFR 431.296. Specifically, the “daily energy consumption” determined and reported for each BVM basic model shall not exceed the relevant “maximum daily energy consumption” value noted in the standard table. Therefore, DOE proposes to update the language at 10 CFR 429.52(b)(2) to request the “daily energy consumption” of covered models and update the language at 10 CFR 431.296 to specify that the “daily energy consumption” of refrigerated bottled or canned shall not exceed the “maximum daily energy consumption” specified in the energy conservation standard table.

11. Treatment of Certain Accessories During Testing

In reviewing its test procedure for refrigerated bottled or canned beverage vending machines, DOE recognized that the existing test procedure does not clearly specify the appropriate operation of some components and accessories when conducting the DOE test procedure. Given this, DOE understands that there is room for misinterpretation of the requirements for equipment configuration where the DOE test procedure is currently ambiguous or silent. As such, DOE is proposing to clarify the proper configuration and operation of several specific components and accessories in the DOE test procedure.

DOE emphasizes that the clarifications discussed in this section III.A.11 serve only to unambiguously specify the intent of the current DOE test procedure. However, DOE recognizes that, because the DOE test procedure was previously silent or ambiguous on the specific treatment of some components, it is possible that some BVM manufacturers misinterpreted

DOE's test procedure and, thus, some BVM models were tested inconsistently. Therefore, some BVM models may require recertification based on these new clarifications, but this is only because these models were not tested in a manner consistent with the DOE test procedure or the majority of BVM models. Since these clarifications do not represent new amendments or requirements when conducting the DOE test procedure, DOE believes that it is appropriate that the proposed revised and additional language be required for equipment testing as of 180 days after publication of any final rule adopting such revised or additional language.

DOE received several comments regarding the requirements for energy-consuming devices unrelated to lighting, refrigeration, or beverage dispensing in the DOE test procedure. AMS commented that ANSI/ASHRAE Standard 32.1 does not mention coin-changing, bill-validating, or cashless systems, one or more of which is always included on a vending machine and some of which may consume energy in amounts that might have a slight effect on DEC. AMS recommended the addition of a clarification that these devices are not required to be in place during testing. (AMS, No. 17 at p. 2) The Joint Comment requested that DOE clarify how machines with interactive touch screens or other energy-consuming features are tested under the current test procedure, and consider amending the test procedure to capture this energy use if it is not currently captured so that manufacturers will have an incentive to reduce this energy use. (Joint Comment, No. 13 at p. 2) Royal recommended an alternate energy specification for beverage vending machines that incorporates off-the-shelf components that contribute to increased energy use, but also have a parallel DOE requirement for energy use. Royal stated that the BVM energy conservation standard should include an appropriate allowance for incorporated components that must meet a separate DOE standard for energy use. (Royal, No. 11 at p. 8)

Royal and NAMA commented that manufacturers are constantly being asked to develop equipment that combines other products and additional functionality beyond cooling of beverages, and that such equipment is generally considered to be outside the scope of the ANSI/ASHRAE Standard 32.1-2010 test procedure. Royal and NAMA further commented that they anticipate an increasing number of customer requests for such components. (Royal, No. 11 at p. 8; NAMA, No. 8 at p. 9)

In addition, Royal and NAMA commented that they offer "heating mode" for outdoor machines in cold climates as an optional accessory; however, this mode has very limited demand and therefore limited impact on annual power used by beverage vending machines in the United States. Royal recommended that DOE not evaluate this feature. (Royal, No. 11 at p. 12; NAMA, No. 8 at p. 15) Royal also commented that none of its vending machines for outdoor applications have heaters or hot gas defrost mode, and that heaters that are installed are probably an after-market component or an optional accessory. (Royal, No. 7 at p. 93)

AMS and Crane Merchandising (Crane) commented that they manufacture and sell machines with heaters for use in outside climates, although the quantities sold are very small and the heaters are only activated in sub-freezing conditions. (AMS, No. 17 at p. 11; Crane, No. 7 at p. 91) Accordingly, AMS recommended DOE disregard the issue altogether. (AMS, No. 17 at p. 11) AMS added that, being at high efficiency on the cooling side generally means equally at high efficiency on the heating side. Because most of these heating systems are based on electricity, which is essentially 100-percent efficient at heating, AMS added that DOE can ignore additional energy use from these features. (AMS, No. 7 at p. 93)

In response to comments submitted by interested parties, DOE notes that any device that is integral to the intended operation of the beverage vending machine must be included in the test. In this context, DOE interprets integral to mean necessary for operation of the BVM model in a manner that meets the DOE definition for refrigerated bottled or canned beverage vending machine. That is, the accessory or component is required for the BVM model to cool bottled or canned beverages and/or dispense bottled or canned beverages on payment. In addition, any manually-controllable energy-consuming accessories that are integral to the performance of the beverage vending machine refrigeration system must be in place during testing if offered for sale with that basic model and must be tested at the most energy-consuming setting. An exception applies for accessories that are controlled by automatic controls, which shall be tested in the automatic state. Optional accessories that do not affect the measured energy use of covered equipment generally do not need to be included in the test. To clarify these requirements, DOE proposes to add language in Appendix A and Appendix B regarding the specific treatment of components and accessories during testing, including the specific exclusion of heaters installed solely for preventing the freezing of sealed beverages in the winter in extremely cold climates. The ensuing sections discuss the treatment of specific features, components, and accessories under the existing and any amended DOE test procedure provisions.

a. Money-Processing Equipment

Money-processing devices are integral to the vending function of the beverage vending machine and, accordingly, should be in place and functional during testing. Money-processing equipment include, but are not limited to coin mechanisms, bill validators, and credit card

readers. When certifying a vending machine, the most energy-consuming combination of money-processing equipment should be used, and all other less energy-consumptive combinations may be listed as different models covered under that basic model. Alternatively, manufacturers may wish to certify and make representations regarding the energy use of each combination of money-processing equipment as a different basic model. In order to certify each combination as a separate basic model, a manufacturer would be required to maintain test data from testing of the machine in each configuration.

b. Interior Lighting

Refrigerated bottled or canned beverage vending machines typically include lighting to illuminate the product, in the case of Class A equipment, or illuminate display panels that also serve as the physical walls of the beverage vending machine. In both cases, these lights are internal to the physical walls of the beverage vending machine and, thus, deemed integral to the operation of the equipment. The DOE test procedure, through incorporation of ANSI/ASHRAE Standard 32.1-2004, currently requires beverage vending machines to be tested with “normal lighting and control settings.” The revised ANSI/ASHRAE Standard 32.1-2010 includes the same requirement.

DOE recognizes that this specification could be interpreted differently in different circumstances and, as such, proposes to amend the regulatory text to clarify the treatment of internal lighting when conducting the DOE test procedure. Specifically, DOE proposes an amendment to the regulatory text stating that lighting that is contained within or is part of the physical boundary of the refrigerated bottled or canned beverage vending machine established by

the top, bottom, and side panels of the equipment be placed in its maximum energy consuming state. DOE believes that the maximum energy consuming state is consistent with the “normal” setting and is the operation most commonly employed in the field. In DOE’s experience, most beverage vending machines employ up to three lighting settings: “on,” “dim,” and “off.” To the extent that there are multiple “on” settings, DOE understands that these settings typically constitute various dimming settings and do not represent settings that are brighter or more-energy consuming than the expected field operation. More importantly, DOE believes that specifying that internal lighting be operated in the maximum energy consuming state provides clear and unambiguous instructions that are not subject to interpretation of testing personnel. DOE believes such a specification will result in consistent and repeatable test results for beverage vending machines under the DOE test procedure.

DOE finds this clarification to be applicable to equipment tested under Appendix A to demonstrate compliance with existing energy conservation standards, as well as to equipment testing using Appendix B to demonstrate compliance with any future energy conservation standards. Therefore, DOE proposes to add language to both Appendix A and Appendix B clarifying that internal lighting shall be operating in its maximum energy consuming state when conducting the DOE test procedure.

DOE requests comment on its proposal to clarify in Appendices A and B that internal lighting shall be operated in the maximum energy consuming state under the DOE test procedure.

DOE requests comment on whether the maximum energy consuming state for internal lighting is consistent with “normal” operation.

c. External Customer Display Signs, Lights, or Digital Screens

In addition to this typical internal case lighting, DOE understands that some refrigerated bottled or canned beverage vending machines may incorporate additional exterior lighting or signage, outside of the body of the refrigerated BVM cabinet. This lighting and signage is optional and is not integral to the cabinet. Further, this auxiliary signage does not illuminate product inside the body of the cabinet. In addition, some models may include touchscreens or lighted displays. DOE recognizes that external customer display signs, lighting, and digital screens will increase the energy use of refrigerated beverage vending machines that include those features, potentially significantly so. For example, the average energy use of televisions and digital screens is approximately 2.58 kWh/day in on mode and 0.01 kWh/day for televisions in stand-by mode¹⁰ (Docket No. EERE-2010-BT-TP-0026, No. 27). The average energy use of a television in on mode represents between 50 and 100 percent of the energy use of an average beverage vending machine, depending on the BVM size and equipment class.

DOE notes that such external customer display signs, lighting, or digital screens are not explicitly addressed in the DOE test procedure or in ANSI/ASHRAE Standard 32.1-2004 and ANSI/ASHRAE Standard 32.1-2010. However, ASHRAE has issued an interpretation to ANSI/ASHRAE Standard 32.1-2010, which states that “the Standard (32.1) addresses the

¹⁰ Note that the DOE test procedure for televisions includes measurement of power consumed in on mode at different screen illumination levels and power consumed in several standby modes. 10 CFR 430.23. This average calculation of daily energy consumption represents an average of the power consumed in each of the on mode and standby mode, respectively, multiplied by 24 hours/day and divided by 1,000 watts/kilowatt.

refrigerated/delivery system portion of the machine. Thus, any peripheral devices, not necessary for the basic function of the vending machine are not addressed by Standard 32.1.” Similarly, DOE finds that external customer display signs, lighting, or digital screens are peripheral to the primary functionality of a refrigerated bottled or canned beverage vending machine, as defined at 10 CFR 431. 292, and thus their energy use should not be accounted for in the measured DEC of BVM models.

Further, as the DOE test procedure does not provide guidance for how to operate such external customer display signs, lighting, and digital screens, it would be inconsistent with the DOE test procedure to include the energy use of external customer display signs, lighting, and digital screens in the measured DEC of BVM models. As such, in the current DOE test procedure, as specified and clarified in Appendix A in this test procedure NOPR, DOE proposes to clarify that customer display signs, lighting, and digital screens that are external to the refrigerated beverage vending machine and not integral to the operation of the primary refrigeration or vending functions (e.g., allow consumers to make a product selection) may be disabled, disconnected, or otherwise de-energized. Lighting that is internal to the refrigerated beverage vending machine cabinet or necessary for the vending function must be placed in its maximum energy consuming state, as discussed in section III.A.11.b. and subsequently in this section III.A.11.c.

Some BVM models also include customer display signs, lighting, or digital screens that are integral to the functionality of the refrigerated beverage vending machine in that it cannot perform the primary refrigeration and vending functions if such equipment is disabled or

removed. For example, if a digital screen is integrated into the cabinetry or controls of a BVM model such that it cannot be independently de-energized or disabled and/or the BVM cannot dispense product without the digital screen being energized, the digital screen would be deemed integral to the BVM model. In this case, the integral customer display signs, lighting, or digital screens should be put in its lowest energy-consuming state. If a digital screen performs the vending or money-processing function, that screen should be placed in its lowest energy-consuming state that still allows the money-processing feature to function. DOE believes that this will provide equitable treatment with other money-processing devices that must be energized, as specified in section III.A.11.a.

To clarify the treatment of external and integrated customer display signs, lighting, and digital screens, DOE proposes to add language to the test procedure in Appendix A specifying the treatment of these devices when certifying BVM models under the existing energy conservation standards. DOE notes that this includes television displays, as commented on by Royal and NAMA.

DOE notes, however, that the use of interactive, multi-purpose energized displays are becoming much more common in new equipment designs. As the use of such customer display signs, lighting, and digital screens become more ubiquitous in refrigerated bottled or canned beverage vending machine design, it may be important to include the energy use of such features in the measured DEC of BVM models. DOE notes that these energized displays are also becoming much more interactive and more commonly are integral to the refrigeration or vending functionality of the refrigerated beverage vending machine. Therefore, it may be more

representative to capture some measure of energy use of external, integral customer display signs, lighting, and digital screens in the measured DEC of the BVM model.

Specifying, however, that external, integral customer display signs, lighting, and digital screens be operated as the equipment would typically be used in the field may significantly increase the energy use of BVM models and capturing the energy use of such auxiliary functions may not be representative of the primary refrigeration and vending functions of the refrigerated beverage vending machine. In addition, specifying typical field operation for the variety of equipment configurations and operating modes may significantly increase the complexity of testing BVM models.

As such, DOE believes that capturing the standby energy use of such external, integral customer display signs, lighting, and digital screens installed on a given BVM model would be a sufficiently representative and reasonable alternative that can be consistently implemented across BVM models. In this way, the energy use associated with the primary refrigeration and vending functions of the refrigerated beverage vending machine continue to constitute the majority of the measured DEC value, but the incremental standby energy use of any external customer display signs, lighting, and digital screens that are integral to the BVM model are minimally accounted for in a consistent and repeatable manner.

Therefore, DOE proposes that under the amended DOE test procedure presented in Appendix B, all external, integral customer display signs, lighting, and digital screens be placed in standby mode. For the purposes of the BVM test procedure, DOE proposes to incorporate a

definition for standby mode, applicable to external, integral customer display signs, lighting, and digital screens in Appendix B. DOE proposes to define standby mode as the mode of operation in which any external, integral customer display signs, lighting, or digital screens are connected to mains power, do not produce the intended illumination, display, or interaction functionality, and can be switched into another mode automatically with only a remote user-generated or an internal signal. If the external, integral customer display signs, lighting, or digital screens do not have a standby mode, the integral customer display signs, lighting, or digital screens would be placed in the lowest energy-consuming state, similar to Appendix A. In addition, if a digital screen performs the vending or money-processing function, that screen should be placed in its lowest energy-consuming state that still allows the money-processing feature to function.

DOE notes that, under this proposal, all non-integral, external customer display signs, lighting, and digital screens that are purely auxiliary and can be independently energized and operated, would continue to be disconnected, disabled, or otherwise de-energized in Appendix B, as specified in Appendix A.

DOE requests comment on the range of equipment that should be addressed in this category of accessories and if the proposed terminology of customer display signs, lighting, and digital screens is sufficient to capture the variety of similar auxiliary energy-consuming accessories that might be installed on BVM models.

DOE requests comment on the treatment of external and integral customer display signs, lighting, and digital screens in Appendix A.

DOE requests comment on the proposed treatment of external and integral customer display signs, lighting, and digital screens in Appendix B. Specifically, DOE requests comment on whether disabling external devices and placing integral devices in standby mode or their lowest energy-consuming state is sufficiently representative of the energy use of refrigerated bottled or canned beverage vending machines.

DOE requests comment on the proposed definition of standby mode as the mode of operation in which the external, integral customer display signs, lighting, or digital screens is connected to mains power, does not produce the intended illumination, display, or interaction functionality, and can be switched into another mode automatically with only a remote user-generated or an internal signal.

For digital screens that also perform the vending or money-processing function, DOE requests comment on the proposal to place these screens in their lowest energy-consuming state that still allows the money-processing feature to function.

d. Anti-Sweat and Other Electric Resistance Heaters

Class A beverage vending machines may come equipped with anti-sweat electric resistance heaters that serve to evaporate any water that condenses on the surface of the door or walls during operation.

DOE proposes to amend the regulatory text to clarify that anti-sweat and other electric resistance heaters should be operational during testing under the DOE test procedure. Models with a user-selectable setting must be turned on and set to the maximum usage position. Models featuring an automatic, non-user-adjustable controller that turns on or off based on environmental conditions must be operating in the automatic state. Additionally, DOE proposes to amend the regulatory text to clarify that, if a unit is not shipped with a controller from the point of manufacture, and is intended to be used with a controller, the manufacturer must make representations of the basic model based upon the rated performance of that basic model as tested when equipped with an appropriate controller. DOE is proposing to add clarifying language in Appendix A and Appendix B to specify that anti-sweat or other electric resistance heaters must be installed and operated in their automatic state, if controlled, or in their maximum energy consuming position, if manually adjustable.

e. Condensate Pan Heaters and Pumps

Beverage vending machines capture water from the air entering the cabinet during operation by causing the water to condense and then freeze on the evaporator coil of the equipment. During a defrost cycle, this frost is melted, and the meltwater produced must be removed from the unit. In many types of equipment, this meltwater is collected in a pan beneath the unit. Some models of beverage vending machines come equipped with electric resistance heaters that evaporate this water out of the pan and into the ambient air. Other models may come equipped with pumps that pump meltwater to an external drain.

In DOE's view, these electric resistance heaters and condensate pumps must be installed and operational during testing pursuant to the DOE test procedure as they would be used in the field during the entire test. The "entire test" includes stabilization, low power mode, and vending state test periods. Prior to the start of the stabilization period, the condensate pan should be dry. During the entirety of the period of the test following the start of the stabilization period, any condensate moisture generated should be allowed to accumulate in the pan, as it would during normal operations. Water should not be manually added to or removed from the condensate pan at any time during the entire test. If the condensate heater or pump is equipped with controls to initiate the operation of the heater or pump based on water level or ambient conditions, these controls may be enabled and the heater or pump should be operated in the automatic setting.

DOE is aware that manufacturers may offer condensate pan heaters and pumps such that they are shipped separately from, or not installed upon, the specific beverage vending machine unit with which they would be used in normal operation. DOE believes that, if the manufacturer offers a given basic model for sale with an available condensate pan heater or pump, the manufacturer must make representations of the performance of the basic model as tested with the feature in place. DOE is proposing to add clarifying language in Appendix A and Appendix B to specify that, during testing pursuant to the DOE test procedure, condensate pan heaters and pumps must be installed and operated as they would be used in the field.

f. Illuminated Temperature Displays

Manufacturers may equip some beverage vending machine models with illuminated displays that provide visual information to the equipment operator regarding, for example, the

temperature inside the refrigerated case. DOE understands this feature to be integral to the design of the given model and proposes to amend the regulatory text to clarify that any illuminated temperature displays should be enabled during the test as they would be during normal field operation. DOE is proposing to add clarifying language in Appendix A and Appendix B to address illuminated temperature displays and alarms.

g. Condenser Filters

Manufacturers may offer models equipped with nonpermanent filters over a model's condenser coil to prevent particulates from blocking the condenser coil and reducing airflow. DOE believes that these filters should be removed during testing pursuant to the DOE test procedure, as such accessories are optional and are not required for operation of the refrigerated bottled or canned beverage vending machine. Further, these optional condenser filters are not expected to significantly impact energy use over the relatively short duration of the DOE test procedure and are more important for the long-term reliability of the equipment in the field. Therefore, to simplify testing of BVM models under the DOE test procedure, DOE proposes to add clarifying language to Appendix A and Appendix B that any optional condenser filters should be removed.

h. Security Covers

Manufacturers may offer for sale with a basic model an option to include straps or other devices to secure the beverage vending machine and prevent theft or tampering. Because such security devices are not anticipated to affect the measured energy use of covered equipment and will likely significantly complicate the loading and testing of BVM models, DOE intended that

these security devices should be removed during testing under the DOE test procedure and proposes to add clarifying language to the proposed test procedures in Appendix A and Appendix B.

i. Coated Coils

Coated coils, generally specified for use in units that will be subjected to environments in which acids or oxidizers are present, are treated with an additional coating (such as a layer of epoxy or polymer) as a barrier to protect the bare metal of the coil from deterioration through environmental contact. DOE believes the existing DOE test procedure accurately accounts for the performance of all types of coils, including those with coatings, and that no additional clarifications are needed in the test procedure.

j. General Purpose Outlets

Some beverage vending machines may be offered for sale with integrated general purpose electrical outlets, which may be used to power additional equipment. DOE intended that, during testing pursuant to the DOE test procedure, no external load should be connected to the general purpose outlets contained within a unit and proposes to add clarifying language to Appendix A and Appendix B.

k. Crankcase Heaters and Electric Resistance Heaters for Cold Weather

Some BVM models feature crankcase heaters or electric resistance heaters designed to keep the compressor warm in order to maintain the refrigerant at optimal conditions. They also prevent freezing of refrigerated beverages contained in the unit when the unit is operating at

extremely low ambient temperatures. In DOE's view, if present, crankcase heaters and other electric resistance heaters for cold weather should be operational during the test. Under this proposal, if a control system, such as a thermostat or electronic controller, is used to modulate the operation of the heater, it should be used as intended per the manufacturer's instructions. DOE is proposing to add clarifying language regarding testing units with crankcase heaters and electric resistance heaters for cold weather.

DOE acknowledges that the types of accessories and components that may be attached to a beverage vending machine are numerous and varied, as noted by Royal and NAMA. Regarding Royal's suggestion concerning calculation methods for different accessories, especially those that are covered under other DOE energy conservation standards, such as televisions, DOE believes that it is more straightforward and representative to measure the energy use of the BVM model directly, including any available energy-consuming accessories that are integral to the function of the beverage vending machine. Due to the variety of accessories that could be incorporated into a BVM model, DOE does not find it practical to incorporate calculations or algorithms into the DOE test procedure that would be sufficiently representative of the energy use of that specific BVM accessory and model. As such, DOE is not proposing any calculation-based methods for the purposes of establishing the energy use of BVM models or specific BVM accessories at this time.

DOE requests comment on its proposal to clarify the treatment of accessories in the DOE test procedure.

DOE also requests comment on any other accessories that may require special treatment or exemption.

B. Summary of the Test Procedure Revisions to Account for Low Power Modes

This NOPR also proposes an amendment to DOE's test procedure for beverage vending machines, to be included in a new Appendix B to 10 CFR part 431, subpart Q, which is intended to be used to demonstrate compliance with any new or amended standards established as a result of the associated ongoing energy conservation standards rulemaking (Docket No. EERE-2013-BT-STD-0022). This amendment would establish provisions to account for equipment with low power modes and is proposed to ensure greater accuracy in testing. The proposed amendment is discussed in the following subsections, including applicable comments received from interested parties, definitions, methods, and DOE's responses.

1. Characteristics of Low Power Modes

Many beverage vending machines are equipped with low power modes designed to be used during periods when demand for refrigerated beverages is low and there is opportunity to reduce equipment energy use without greatly affecting consumer utility. The features of these modes may include (but are not limited to) switching off or dimming lights, and raising the temperature set point (to which the unit cools the product) to a value higher than the temperature set point associated with the unit's vending mode. These low power modes are typically activated during periods when customer traffic is known or anticipated to be minimal or nonexistent (such as at night or when a facility is closed), though they may also be activated based on short-term historical vend patterns or after a specified length of inactivity. Some low

power modes may be operated on fixed schedules, while others may operate based on sensor input such as that from a motion sensor or customer interface on the machine. Individual machines may have multiple low power modes, such as a fixed low power mode allowing the refrigeration system to shut off during periods when customers are not available and an active low power mode during vending periods that dims the lights when customer activity is not detected after a certain length of time.

ANSI/ASHRAE Standard 32.1-2004, the test method incorporated by reference in the current DOE test procedure, and ANSI/ASHRAE Standard 32.1-2010, the test method DOE proposes to incorporate by reference in this test procedure NOPR, both require that the vending machine be “operated with normal lighting and control settings, using only those energy management controls that are permanently operational and not capable of being adjusted by a machine operator.” (ANSI/ASHRAE Standard 32.1-2004 7.1.1(d)) These test procedures do not capture the widely available user-adjustable low power modes of operation in a representative manner, and manufacturers that offer this functionality are not able to reflect the increased efficiency of the unit under either of these test methods.

Additionally, these test methods do not specify how to test equipment that has permanently operational controls that can be adjusted. An example of such equipment could be a machine with lights that automatically dim after a certain period of inactivity, and where the length of the period of inactivity required to cause the lights to dim can be adjusted to one of several values by a machine operator. In such a case, the lighting controls are permanently operational, but adjustable by a machine operator.

Section 7.2.2.4 of ANSI/ASHRAE Standard 32.1-2004 and ANSI/ASHRAE Standard 32.1-2010 both specify that “the test chamber and vending machine shall not be disturbed throughout the duration of the energy consumption test once the measurement instrumentation is in place.” As already mentioned, DOE is aware that some currently available beverage vending machines come equipped with low power modes or features that become active after a certain period of inactivity. Due to the requirements of section 7.2.2.4 of ANSI/ASHRAE Standard 32.1 (both 2004 and 2010 versions), it is possible for such features to become active during the test period for unrepresentative periods of time.

2. Comments Received by Interested Parties

DOE received a variety of comments on the 2013 BVM Framework describing the current use of low power modes in BVM testing and the low power modes currently available on the market. Some of these comments supported capturing the effect of low power modes and even suggested approaches to account for low power modes in the test procedure. Other commenters opposed accounting for low power mode for several reasons.

NAMA commented that all equipment should be tested as supplied by the factory, and only low power modes that cannot be disabled by the end user should be included in the test because allowing other low power modes creates the opportunity for the misrepresentation of the equipment’s energy use and ambiguity within the test method. (NAMA, No. 13 at p. 2) Royal and NAMA each commented that models with user-adjustable controls that cannot be disabled should be operated in accordance with the manufacturer’s recommended mode of operation

under normal conditions or as shipped by the manufacturer, whichever results in higher energy use. (Royal, No. 11 at p. 5; NAMA, No. 8 at p. 4) The Joint Comment requested that DOE clarify how controls that cannot be adjusted in the field are currently captured by the DOE test procedures, and stated that the current application of the DOE test procedure may not be adequately reflecting field energy use. (Joint Comment, No. 13 at p. 2) The CA IOUs encouraged DOE to try to ensure that the output of the test procedure comes close to representing the real-world energy use of equipment installed in the field, consistent with EPCA requirements, and especially that low power modes do not allow lights to be dimmed or powered off for uncharacteristically long periods of time as ANSI/ASHRAE Standard 32.1 currently permits. (CA IOUs, No. 19 at p. 4)

NAMA commented that, as it understands, some equipment has power management functions installed by the original equipment manufacturer that cannot be disabled by the end user in any way and, therefore, are active during the ANSI/ASHRAE Standard 32.1 test, but that some of this equipment has energy management settings that the user can modify that therefore does not meet the requirements of the ANSI/ASHRAE Standard 32.1 test settings as currently written. (NAMA, No. 8 at p. 4) Royal commented that its machines have energy management features that are built into the software but do not meet the requirement in ANSI/ASHRAE Standard 32.1-2010 because the user can modify the energy management settings, and low power modes are accordingly not used during testing. (Royal, No. 11 at p. 4) AMS stated that its equipment includes controls that can be used both to increase operating set point temperatures and to decrease lighting intensity during periods of no sales activity, but that in accordance with its interpretation of ANSI/ASHRAE Standard 32.1, these controls have never been used during

testing. (AMS, No. 17 at p. 2) AMS further described the low power software in its machines, which includes lighting and refrigeration low power modes that are entered into either based on sales history or by operator programming, and noted that the elevated temperature is prohibited if the health and safety controls are set for items such as milk, which is a beverage but also a perishable item that requires strict temperature control. (AMS, No. 17 at p. 3) AMS also commented that the field-allowable times of low power mode can vary widely; from 0 to 15 hours per day during the week and total weekend periods, and that any benchmark is just a benchmark and cannot be expected to exactly reflect the true activity of a specific machine in the field. (AMS, No. 17 at p. 3)

Royal did not support the creation of a provision to measure the low power modes of operation, stating that tests should not be conducted or accepted if the average product temperature cannot be maintained within 36 °F (± 1 °F) as specified in ANSI/ASHRAE Standard 32.1-2010. (Royal, No. 8 at p. 5) NAMA commented that it does not support the creation of a provision to measure the impact of low power modes of operation, except in the case where an energy management system is incorporated into the original equipment manufacturer design of the vending machine and cannot be defeated or removed by the end user. (NAMA, No. 8 at p. 5) Wittern stated that it opposed the creation of a provision to measure the impact of low power modes of operation as it would add another level of complexity, and it wants to keep testing, reporting, and compliance related issues to a minimum. (Wittern, No. 16 at p. 2) AMS agreed that the present test method does not capture the energy savings potential of optional power-saving modes. (AMS, No. 17 at p. 4)

The CA IOUs commented that throughout the rulemaking process, DOE should collect information from industry, purchasers, and consumers on usage profiles of vending machines in order to best represent real-world energy use in the test procedure. (CA IOUs, No. 19 at p. 4) The CA IOUs also commented that DOE should include provisions to measure the energy use of beverage vending machines in low power modes and get an understanding of how such states are employed in installed equipment. (CA IOUs, No. 19 at p. 4) The Joint Comment stated that it generally supports the inclusion of test procedure provisions to capture the energy savings benefit of controls, but encouraged DOE to attempt to use field use data so that the test procedures can reasonably reflect the actual energy savings from these controls. (Joint Comment, No. 13 at p. 2) AMS recommended that if evaluation of energy-saving options is to be done at all, it should be done in a totally separate specification and procedure because the wide range of energy-saving options would be very difficult to standardize in the basic MDEC requirements. (AMS, No. 17 at p. 3) AMS further commented that if measurements of low power modes are made they should be done with fixed temperature, lighting, and any other low-energy settings that may be used and be done for a fixed period of time less than 24 hours with calculations applied to determine the potential savings per 24-hour period. (AMS, No. 17 at p. 3)

3. DOE's Proposed Low Power Mode Test Provisions

DOE is proposing to amend its test procedure to provide clear and consistent provisions for testing beverage vending machines both in low power mode and in vending environments and to indicate what settings are to be used for the testing of machines with energy management controls that are permanently operational (meaning those that cannot be disabled) but can be adjusted by the operator. DOE acknowledges the concerns of interested parties but believes that

a BVM test procedure that accounts for low power modes of operation is necessary for accuracy of testing, since beverage vending machines are commonly equipped and operated with low power modes in the field. Sections a, b, and f of this section III.B.3 discuss definitions related to the low power mode test procedure, a physical test method DOE considered, and DOE's proposed method for accounting for low power modes of operation in the DOE test procedure, respectively.

a. Definitions Related to the Low Power Mode Test Procedure

DOE is proposing to allow manufacturers of equipment with a low power mode to enable those features during a fixed period of time during the BVM test procedure. DOE proposes to define "low power mode" as a state in which a beverage vending machine's lighting, refrigeration, and/or other energy-using systems are automatically adjusted (without user intervention) such that they consume less energy than they consume in an active vending environment when the beverage vending machine is capable of dispensing sealed beverages at the intended vending temperature (36 ± 1 °F).

DOE also notes that it may be beneficial to differentiate between low power modes that affect the refrigeration system and allow the cabinet temperature to increase during a specified period and those that affect other energy-consuming accessories, such as lighting, display signage, or vending equipment. As such, DOE proposes to define "refrigeration system low power mode" and "accessory low power mode." Refrigeration system low power mode would be defined as a state in which a beverage vending machine's refrigeration system is in low power mode. To qualify as refrigeration system low power mode, the average next-to-vend temperature

must automatically (without user intervention) raise to 40 °F or higher and remain above this threshold for at least one hour. “Accessory low power mode” would be defined as a state in which a beverage vending machine’s lighting and/or other non-refrigeration energy-using systems are in low power mode. This may include, but is not limited to, dimming or turning off lights or display signage, but does not include adjustment of the refrigeration system.

DOE requests comment on its proposed definitions of “low power mode,” “refrigeration low power mode,” and “accessory low power mode.”

b. Potential Low Power Mode Test Methods Based on Physical Testing

DOE considered several options to account for low power modes in the DOE test procedure for beverage vending machines, including physical testing and calculation-based methods. DOE recognizes that objectively determining the performance of low power mode operation by accounting for both refrigeration and accessory low power modes would be the most accurate way to best represent the variety of low power mode controls available. In addition, a physical test method would provide an unambiguous verification of low power mode efficacy and performance. As such, DOE considered an approach to account for low power modes of operation using two separate physical test procedures; one for the active vending state and one for the low power mode. This approach could combine the respective measured energy use from each test using a calculation. Such a method may be able to reflect the variations among different types of refrigeration low power modes and would physically verify the performance of the refrigeration low power mode. However, because this approach would not account for the pull-down from low power mode to return to vending state, DOE determined that a method that

does not account for pull-down energy use is not sufficiently representative of the energy use of this equipment over a representative cycle of use.

DOE also considered an approach in which equipment was allowed to enter low power mode, including both refrigeration and accessory low power modes, during a low power mode test period and required to return to the specified average next-to-vend temperature at the conclusion of the test. This would result in a test that included an 18-hour vending state test period, followed by a 6-hour low power mode test period, and finally a pull-down test period when the beverage vending machine would be required to return to 36 ± 1 °F for a duration of time, for example 1 minute, prior to concluding the test. The energy use associated with the 6-hour low power mode test period would then be adjusted to account for the length of the pull-down period to represent the energy use associated with a 6-hour period when vending is not required. For example, for a BVM model that took 1 hour to pull down, the energy use associated with the 6-hour low power mode test period would be reduced by 1 hour (i.e., multiplied by 5/6). The measured DEC for that BVM model would then consist of the energy use associated with the vending state test period, the pull-down test period, and the adjusted low power mode test period. Such a method would provide an accurate representation of the variety of low power modes used in beverage vending machines over a 24-hour cycle of use.

While physical testing of low power mode and any necessary pull-down requirements would be the most accurate test method to account for both accessory and refrigeration low power modes of operation, it is DOE's understanding that refrigeration low power modes are extremely variable in terms of their control strategies and operation and, thus, this method may

be difficult to implement in a repeatable manner. For example, some refrigerated beverage vending machines may have a pull-down period in excess of 6-hours, in which case this method would not be appropriate. For those models, the energy consumed during the low power mode test period and the pull-down test period could be scaled to 6-hours and added to the vending state test period energy use. However, such an approach would benefit beverage vending machines with pull-down periods longer than 6-hours and may provide a means for manufacturers to exploit the test procedure by designing equipment with extremely slow pull-down periods. Since this would reduce customer utility, DOE does not believe pull-down periods in excess of 6-hours would be common, but the possibility still exists to unfairly advantage equipment with extremely long pull-down periods.

In addition, DOE believes that some refrigeration low power modes may require specific instructions from the manufacturer to modify or adjust the control systems precisely to accommodate the specific 6-hour time frame for low power mode operation, since the control variables are not always uniquely controllable via the user interface. This would also reduce the consistency and repeatability of such a physical test method and would make the method impractical to implement. Due to the difficulty of representing the wide variety of refrigeration low power modes in a consistent, fair, and reasonable manner, DOE determined that a purely physical test method may not be feasible.

c. Potential Low Power Mode Test Methods Using a Combination of Physical Testing for Accessory Low Power Mode and Calculated Credits for Refrigeration Low Power Mode

To address the issue with repeatability, DOE also considered an alternate calculation-based approach. In this method, the 6-hour low power mode test period would only employ the accessory low power modes and the refrigeration system low power mode would not be engaged. Specifically, accessory low power modes that do not affect the cabinet temperature may be activated to adjust lighting, display signs, vending equipment, and other energized accessories to their minimally energy-consuming state. However, all other requirements of the DOE test procedure remain unchanged, the unit being tested must remain connected to its power source throughout the test, and the test package temperature measurements taken during the low power mode test are incorporated into the integrated average temperature calculation. Under this method, refrigeration low power modes should not be enabled during the physical low power mode test. DOE believes that accessory low power modes are somewhat more consistent and easier to characterize under a physical test procedure and the resulting energy use reduction associated with the accessory low power mode test procedure will accurately represent the efficacy of accessory low power mode controls.

DOE is aware, however, that beverage vending machines may be equipped with refrigeration low power modes that have the capability of saving energy in the field when the amount of extra energy consumption required to pull down from the elevated temperatures is less than the amount of energy saved during the refrigeration low power mode when the cabinet temperature is above the vending temperature. To account for the energy use of the refrigeration

low power mode and the associated pull-down period in a consistent and repeatable manner, DOE also considered providing a calculation credit to those machines equipped with a refrigeration low power mode. Specifically, DOE is proposing to amend its test procedure to allow a credit equal to 3 percent of the measured DEC of any unit equipped with a refrigeration low power mode.

DOE developed the 3 percent value based upon data from tests of the refrigeration low power modes of five different models (four Class A and one Class B). All units were tested by a third-party test laboratory using the current DOE BVM test procedure. The models selected represented a cross-section of the largest BVM manufacturers in the United States. Each unit was programmed to enter the low power mode at a specified time after temperature stabilization had been achieved and to exit the low power mode at a second specified time. Data was collected throughout the duration of the low power mode and continuously through the ensuing pull-down period until the next-to-vend beverage temperature was again within the DOE test-specified $36^{\circ}\text{F} \pm 1^{\circ}\text{F}$.

The resulting test data was used to calculate approximate energy savings during a 6-hour window during which the average next-to-vend temperature was outside of the bounds of the required value for the DOE test procedure. This would correspond to the unit entering the refrigeration low power mode during a time when vending would not be expected to occur, and DOE used 6 hours as a representative duration of time for such a period. The energy consumption from the beginning of the window until the cabinet temperature had risen to a particular average next-to-vend temperature T_{max} was added to the pulldown energy use from

that same T_{\max} back to within the DOE test specified $36^{\circ}\text{F} \pm 1^{\circ}\text{F}$ average next-to-vend temperature. T_{\max} was selected such that the time spent in the low power mode plus the time spent to pull down was as close to 6 hours as possible within the resolution of the data, without being over 6 hours. The low power mode energy consumption was calculated as the sum of the energy consumption during the period when the temperature was “out-of-bounds,” the energy consumption in that portion of the pulldown, and, in order to account for the fact that lighting low power modes were employed with refrigeration low power modes, the amount of lighting energy that would have been used for normal operation in active vending mode was assumed during the duration of the low power mode. A DEC value was generated by using the “out-of-bounds” energy consumption and the time-averaged steady state energy consumption from the DOE test procedure scaled by the remaining time to 24 hours. The percent savings from the refrigeration low power mode was then calculated by comparing this DEC to the DEC results of the DOE test procedure for the same unit.

Using this method, the energy savings from refrigeration low power modes in units tested averaged approximately 2.4%. DOE estimated that its methodology was conservative, because the out of bounds time used in the calculations was always less than the 6 hours out of bounds time being used as representative of typical applications. Therefore, DOE rounded up, using 3% as an estimate of savings attributable to refrigeration low power modes. In light of this initial investigation, DOE believes that 3 percent is representative of the refrigeration low power mode that is activated such that the average next-to-vend temperature is raised for a total of 6 hours, including both low power mode and pull-down, and therefore aligns with the methodology DOE is proposing for testing of other low power modes. DOE believes that a calculated energy credit

will provide a reasonable representation of refrigeration low power modes without sacrificing test procedure repeatability, favoring specific technologies, or unnecessarily increasing burden.

d. Refrigeration Low Power Mode Verification Test Protocol

DOE recognizes that a calculated energy credit will not account for differences in performance or efficacy among different types of refrigeration low power modes and will not objectively verify the performance or existence of a refrigerated low power mode. Therefore, a procedure to verify the existence of a refrigeration low power mode, as defined, may be required to prevent BVM models from taking the 3 percent refrigeration low power mode credit without an effective refrigeration low power mode included in that BVM model. Such a refrigeration low power mode verification test method would include initiating the refrigeration low power mode after completion of the 24-hour BVM test period, including the 18-hour active vending test period and the 6-hour low power mode test period, and recording the average temperature of the standard test packages in the next-to-vend beverage positions for the next 2 hours. Over the course of this 2-hour period, the instantaneous average next-to-vend beverage temperatures, that is the spatial average of all next-to-vend beverages, must increase above 40 °F and remain above 40 °F for at least one hour. The refrigerated beverage vending machine must also be capable of automatically returning itself to its normal operating conditions at the conclusion of the refrigeration low power mode. Therefore, at the conclusion of the 2-hour refrigeration low power mode verification test period, the refrigerated beverage vending machine must return to normal vending temperatures automatically without direct physical intervention by testing personnel. DOE notes that this validation test is not required to verify the DEC of BVM models but will be

employed by DOE for enforcement purposes to verify the existence of a refrigeration low power mode.

e. DOE's Proposed Low Power Mode Test Method

After considering the various methods, DOE determined that the calculation-based approach to accounting for refrigeration low power modes is the best methodology available to ensure accuracy of representation of energy use, consistent and equitable treatment among models and repeatability of the test procedure without making the test method unduly burdensome to conduct. In contrast, DOE is proposing to establish a physical test that consists of a 6-hour time period that allows accessory low power modes that automatically disable or adjust lighting, displays, or other low power mode systems to be enabled to account for accessory low power modes, and a separate calculation approach to account for refrigeration low power modes.

Under this proposal, equipment with a low power mode would stabilize and operate under normal test procedure conditions, with all equipment and accessories energized as they would be when the equipment is capable of actively refrigerating and vending sealed beverages and as specified in section III.A.11, for the first 18 hours of the test period. In addition, unless specified otherwise by another portion of the test procedure, DOE is proposing that all low power mode control features that cannot be disabled, but can be adjusted, are to be adjusted such that the DEC is maximized, to best represent the likely performance of the equipment in the field in active vending mode. DOE is also proposing to adopt in its test procedure a modification to ANSI/ASHRAE Standard 32.1 requiring that any party performing the test procedure provide, if necessary, any physical stimuli or other input to the machine that may be needed to prevent

automatic activation of low power modes during the vending state test period. Such stimuli could include creating movement near a unit being tested or pressing a selection button on the machine (without vending a test package). In the example above, in which the lights on a particular BVM dim after extended inactivity, the setting specified would be the one with the longest period of inactivity required before the lights would dim and periodic physical stimuli would be needed based on that period to prevent the lights from dimming. This would be most representative of the energy use of the equipment in active vending mode, when the equipment is capable of refrigerating and dispensing sealed beverages.

For equipment with a low power mode, the low power mode may be enabled for no more than the final 6 hours of the test, or from hour 18 to hour 24 of the 24- hour test. The 6-hour low power mode test period is intended to represent off hours between two periods of vending. The low power mode should account for both refrigeration system low power modes and accessory low power modes. While there is a wide range of types of low power mode controls and time periods, for which these controls are enabled, DOE believes a timeframe of 6 hours is a reasonable representation of average field use.

To determine the measured DEC of a given BVM model equipped with a refrigeration low power mode, the energy use measured during the 24-hour BVM test procedure, including the 6-hour accessory low power mode test period if applicable, will be reduced by 3 percent (or multiplied by 0.97).

Under this proposal, the rating metric for all equipment would continue to be the energy use measured during the total 24-hour test period, including any calculated adjustments.

Further, DOE proposes adopting a refrigeration low power mode validation procedure, to verify the existence and performance of the refrigeration low power mode on applicable BVM models. However, this refrigeration low power mode validation procedure will not be required for manufacturer certifications of compliance and will only be used to confirm the existence of a refrigeration low power mode for the purposes of applying the refrigeration low power mode credit.

f. Equipment with Multiple Energy Use States

DOE recognizes that its proposal to only recognize and account for three operating modes, that is, refrigeration system low power mode, accessory low power mode, and active vending mode, may not account for equipment with multiple energy use states. For example, some equipment may have controls that automatically adjust lighting levels during periods of lower vending activity, such as times during a facility's normal operating hours when few or no purchases are occurring, in addition to the more dramatic low power mode that is engaged when the facility is closed. This situation may be representative of field use in some situations, such as schools, where there may be times of concentrated activity during the day interspersed with periods of inactivity during which a partial low power mode is entered.

DOE considered several approaches to account for these types of vending state low power modes. The first of these approaches is to permit an additional time period within the

BVM test procedure during which lighting and control settings are permitted to be at manufacturer-recommended rather than maximum-energy-use settings and during which external inputs to prevent low power modes are not required. This could, for example, constitute 9 hours, or one-half of the remaining vending state test period after the 6-hour low power mode test period has been taken into account.

The second of these approaches is to continue allowing a single low power mode test period in the DOE test procedure, and to also offer a calculation-based energy offset to those machines equipped with additional low power modes designed to operate during active vending periods when the beverage vending machine is capable of dispensing sealed beverages at the intended vending temperature (36 ± 1 °F). This method would include calculation of the direct and indirect energy use associated with such vending state low power modes. To implement such a method, default assumptions would be necessary for the following variables:

- 1) the length of time vending state low power modes are employed,
- 2) the efficiency of the compressor,
- 3) the features generally controlled by a vending state low power mode, and
- 4) the portion of energy produced from the lights or other features that becomes heat in the case and increases the refrigeration load.

After consideration, DOE has decided to propose the methodology in which equipment is prohibited from entering low power modes of any kind outside of the 6-hour low power mode test period. A wide range of energy management systems are available in beverage vending machines, and DOE believes that an 18-hour time period representative of an active, vending

state at full power followed by a 6-hour low power mode test period provides a consistent methodology for testing that is applicable to the most BVM models and is reasonably representative of field use. DOE also notes that the low power modes designed to operate during vending periods, such as the lighting controls discussed above, can be enabled during the low power mode test period and accounted for in the same manner as any other low power mode operation. Only in the case where a beverage vending machine is equipped with both a more aggressive low power mode, designed for periods of facility closure, and a partial low power mode, designed for periods of inactivity during operating hours, will the operation of the two different low power modes not be taken into account independently.

DOE requests comment on its proposal that units run at the most energy-consuming lighting and control settings, except as specified in section III.A.11, during the BVM test procedure, except for during the 6-hour low power mode test period.

DOE requests comment on its proposal to require, as part of the test procedure, whatever stimuli are necessary to prevent automatic activation of low power modes during the vending state test procedure.

DOE requests comment on whether its proposed method is representative of equipment that can use low power modes. DOE requests comment as to whether the proposed method reflects typical field use.

DOE requests comment on whether 6 hours is an appropriate length of time for the low power mode test period.

DOE requests information on the prevalence of non-cycling (variable-speed) compressors in the BVM industry.

DOE requests comment on whether a credit equal to 3 percent of the measured DEC is reflective of the 6 hours of time in refrigeration low power mode.

DOE requests comment on the refrigeration low power mode validation test and, particularly, if a one hour time period in which the instantaneous average of all standard test packages in the next-to-vend beverage position is maintained above 40 °F is appropriate to verify the performance of refrigeration low power modes.

DOE requests comment on whether a physical test method would be a more representative and accurate method to account for low power mode operation, including refrigeration low power mode.

IV. Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget (OMB) has determined that test procedure rulemakings do not constitute “significant regulatory actions” under section 3(f) of Executive

Order 12866, “Regulatory Planning and Review,” 58 FR 51735 (Oct. 4, 1993). Accordingly, this action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs (OIRA) in OMB.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires preparation of a regulatory flexibility analysis (RFA) for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. A regulatory flexibility analysis examines the impact of the rule on small entities and considers alternative ways of reducing negative effects. Also, as required by Executive Order 13272, “Proper Consideration of Small Entities in Agency Rulemaking,” 67 FR 53461 (Aug. 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR at 7990. DOE has made its procedures and policies available on the Office of the General Counsel’s website:

<http://energy.gov/gc/office-general-counsel>.

DOE reviewed this proposed rule, which would amend the test procedure for refrigerated beverage vending machines, under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. DOE tentatively concludes and certifies that the proposed rule, if adopted, would not result in a significant impact on a substantial number of small entities. The factual basis for this certification is set forth below.

For the BVM manufacturing industry, the Small Business Administration (SBA) has set a size threshold, which defines those entities classified as “small businesses” for the purpose of the statute. DOE used the SBA’s size standards to determine whether any small entities would be required to comply with the rule. The size standards are codified at 13 CFR part 121. The size standards are listed by North American Industry Classification System (NAICS) code and industry description and are available at www.sba.gov/sites/default/files/files/Size_Standards_Table.pdf. BVM manufacturers are classified under NAICS 333318, “Other Commercial and Service Industry Machinery Manufacturing.” The SBA sets a threshold of 1,000 employees or less for an entity to be considered as a small business for this category.

DOE conducted a market survey of small business manufacturers of equipment covered by this rulemaking using all available public information. DOE’s research involved the review of individual company websites and marketing research tools (e.g., Dun and Bradstreet reports, Manta) to create a list of companies that manufacture or sell beverage vending machines covered by this rulemaking. Using these sources, DOE identified seven manufacturers of beverage vending machines.

DOE then reviewed these data to determine whether the entities met the SBA’s definition of a small business manufacturer of beverage vending machines and screened out companies that do not offer equipment covered by this rulemaking, do not meet the definition of a “small business,” or are foreign owned and operated. Based on this review, DOE has identified five

companies that would be considered small manufacturers, which represents 71 percent of the national BVM manufacturers.

Table IV.1 stratifies the small businesses according to their number of employees. The smallest company has 2 employees and the largest company has 375 employees. The majority of the small businesses affected by this rulemaking (80 percent) have fewer than 200 employees. According to DOE's analysis, annual revenues associated with these small manufacturers were estimated at \$107.3 million (\$21.5 million average annual revenue per small manufacturer).

Table IV.1 Small Business Size by Number of Employees

Number of Employees	Number of Small Businesses	Percentage of Small Businesses	Cumulative Percentage
1-25	2	40.0%	40.0%
26-50	0	0.0%	40.0%
51-75	1	20.0%	60.0%
76-100	0	0.0%	60.0%
101-200	1	20.0%	80.0%
201-300	0	0.0%	80.0%
301-400	1	20.0%	100.0%
401-500	0	0.0%	100.0%
501-1000	0	0.0%	100.0%
Total	5		

This NOPR proposes to update the industry test procedures referenced in the DOE test procedure for refrigerated beverage vending machines. In addition, DOE proposes to do the following:

- 1) eliminate the requirement of a test performed at the 90 °F ambient test condition;
- 2) establish a procedure to test combination vending machines;
- 3) clarify how to load the vending machine models when conducting the DOE test procedure;

- 4) specify the characteristics of the standard product;
- 5) clarify the next-to-vend temperature test condition;
- 6) establish a definition of “fully cooled” to more clearly differentiate Class A and Class B equipment;
- 7) specify the placement of thermocouples during testing;
- 8) add provisions to allow for refrigerated beverage vending machines that cannot achieve the currently prescribed 36 °F average of next-to-vend beverage temperatures to be tested at the lowest application product temperature;
- 9) clarify the treatment of specific components and accessories in the test procedure; and
- 10) add a method to account for energy impacts of low power modes.

All beverage vending machines covered by this proposed rule are currently required to be tested using the DOE test procedure to show compliance with established energy conservation standards. Manufacturers must use the DOE test procedure established in the 2006 BVM test procedure final rule to demonstrate compliance with existing standards. That test procedure incorporates by reference ANSI/ASHRAE Standard 32.1-2004 and ANSI/AHAM HRF-1-2004 and consists of one 24-hour test at standard rating conditions to determine DEC of covered beverage vending machines during a representative cycle of use. 71 FR 71340, 71355 (Dec. 8, 2006). DOE estimates the cost of conducting the DOE test procedure as \$5,000 per 24-hour test.

Six of the amendments proposed in this test procedure NOPR will not change the testing burden for covered equipment. These include the amendments discussing the test procedure for

combination vending machines, loading the vending machines when conducting the test procedure, specifying the characteristics of the standard test package, clarifying the next-to-vend temperature test condition, establishing a definition of “fully cooled,” and specifying the placement of thermocouples during testing. Specifically, the amendments regarding the next-to-vend temperature condition and the definition of “fully cooled” serve only to establish new definitions that will clarify DOE’s existing test procedure requirements.

This test procedure NOPR also proposes five amendments to the current DOE test procedure that may impact the test procedure burden. The expected incremental increases or decreases of costs for conducting the test procedure specific to each amendment proposed are discussed below.

As discussed in section III.A.1, updating the referenced industry test procedures will not change the test procedure burden because it will not change the technical requirements of the test procedure..

Eliminating testing at the 90 °F ambient test condition should substantially lessen the testing burden on manufacturers, as it decreases the testing requirements from two tests, totaling approximately 120 hours duration, to one test of approximately 60 hours duration. DOE estimates the decrease in burden to be 10 hours of labor and 60 hours of facility use, which reduces the testing cost for each beverage vending machine unit by roughly \$2,500, or half the cost of conducting the existing test procedure.

Establishing a definition and associated verification test method for determining if a given BVM model is “fully cooled” is not required for product certification. However, if manufacturers were to elect to verify equipment classification using this optional procedure, the incremental burden associated with doing so would be the placement and recording of temperature for 4 additional standard test packages. DOE estimates this cost as \$5 in material costs and 4 hours of an engineer’s time for each standard test package, which can be amortized over the total number of tested models. In addition, DOE estimates the incremental cost of a thermocouple and associated length of thermocouple wire as \$30 per standard test package. The incremental burden associated with placing these additional standard test packages is estimated as approximately 30 minutes of an engineer’s time for each test. DOE estimated the cost of an engineer’s time based on an average hourly salary of \$41.44 for an engineer completing this task.¹¹ Fringe benefits are estimated at 30 percent of total compensation, which brings the hourly costs to employers to \$53.87.¹² DOE does not believe the additional calculations will induce any incremental burden when performing the DOE test procedure. In total, this optional test would increase the average test burden by approximately \$61.18 for each model.

Establishing testing provisions at the lowest application product temperature affects only a very small percentage of equipment on the market, estimated to be less than 2 percent of shipments. Manufacturers who make equipment affected by this provision should experience a decrease in burden because they will no longer have to seek waivers for equipment that cannot maintain the $36^{\circ}\text{F} \pm 1^{\circ}\text{F}$ average next-to-vend temperature for the duration of the test. For these

¹¹ U.S. Department of Labor, Bureau of Labor Statistics. 2012. National Occupational Employment and Wage Estimates. Washington, D.C. Available at www.bls.gov/oes/current/oes_nat.htm#17-0000.

¹² U.S. Department of Labor, Bureau of Labor Statistics. 2013. Employer Costs for Employee Compensation - Management, Professional, and Related Employees. Washington, D.C.

manufacturers, DOE estimates a savings of 4 hours of labor for each BVM model, or \$215.48 per model. DOE bases its estimate on the average hourly compensation for an engineer of \$53.87, as previously estimated.

Clarifying the treatment of various and components and accessories in the DOE test procedure should not alter the technical requirements of the DOE test procedure, since these additional specifications are meant to clarify existing requirements. However, DOE understands that the treatment of some of these accessories and components may have been inconsistent due to lack of clarity or misinterpretation of the DOE test procedure. Therefore, DOE is accounting for the incremental burden associated with properly configuring BVM models for testing in accordance with these new component specifications. The specific clarifications pertain to money-processing equipment, interior lighting, external displays and screens, anti-sweat heaters, condensate pan heaters and pumps, illuminated temperature displays, condenser filters, security covers, coated coils, general purpose outlets, and crankcase heaters and electric resistance heaters for cold weather. The adjustments to these accessories will require additional attention by test personnel. DOE estimates that it may require up to an additional hour to make all the applicable adjustments before testing begins. DOE estimates the incremental costs associated with adjusting accessories as \$53.87 for each tested model, based on the assumption that it would take an additional hour of an engineer's time to attend to the tested model at the same labor rate assumed previously, \$53.87 per hour.

Amendments in this NOPR expanding the testing methodology to incorporate lighting and control settings to account for low power modes will require additional attention by test

personnel. Specifically, DOE estimates it will require 1 hour to identify the appropriate time to initiate the low power mode test period and make any necessary adjustments to begin low power mode operation at that time. During the active vending mode test procedure, DOE estimates that it will take a maximum of 10 additional hours of an engineer's time to periodically monitor the operation of the tested unit and interact with the unit if necessary to ensure that the unit does not re-enter a low power mode state. DOE does not believe that multiplying the DEC by 0.97 will increase the burden associated with conducting the DOE test procedure. However, DOE is also proposing an optional refrigeration low power mode verification test that manufacturers may elect to perform to ensure their equipment meets the requirements of a refrigeration low power mode, which would increase the test burden. DOE estimates that this test would require an additional 4 hours of test time, 2 hours to allow the refrigeration low power mode to initiate and maintain the adjusted refrigeration state and an assumed 2 hours to return to 36 ± 1 °F to verify that the BVM model can automatically return to vending conditions. DOE estimates the incremental costs associated with conducting the low power mode test as \$592.57 for each model tested, based on the assumption that it would take an engineer an additional 11 hours to attend to the tested model at the same labor rate assumed previously, \$53.87 per hour. If also accounting for the optional refrigeration low power mode verification test method, the incremental cost of the low power mode test procedure amendments increases to \$808.05.

All of the amendments and clarifications proposed in this NOPR, taken together, will result in an overall reduction in burden for manufacturers conducting the DOE test procedure due, primarily, to the removal of the requirement to test at the 90 °F ambient condition. On average, the cost of testing covered beverage vending machines would be reduced by

approximately \$1,900 per model, or by 40 percent per manufacturer, not including the optional tests that are not required for certification of BVM models.

DOE believes that the proposed test procedure amendments would not have a significant economic impact on a substantial number of small entities due to decreased testing cost burden. Therefore, the preparation of a regulatory flexibility analysis is not required. DOE will transmit the certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b).

DOE requests comment on its certification that the proposed test procedure changes will not have a significant impact on a substantial number of small entities.

C. Review Under the Paperwork Reduction Act

Manufacturers of refrigerated beverage vending machines must certify to DOE that their equipment complies with any applicable energy conservation standards. In certifying compliance, manufacturers must test their equipment according to the DOE test procedure for refrigerated beverage vending machines, including any amendments adopted for that test procedure. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including beverage vending machines. 76 FR 12422 (March 7, 2011). The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This requirement has been approved by OMB under OMB Control Number 1910-1400. The public reporting burden for the certification is estimated to average 20

hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

D. Review Under the National Environmental Policy Act

In this proposed rule, DOE proposes amendments to its test procedure that may be used to implement future energy conservation standards for refrigerated beverage vending machines. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.). The rule is covered by Categorical Exclusion A5, for rulemakings that interpret or amend an existing rule without changing the environmental effect, as set forth in DOE's NEPA regulations in appendix A to subpart D, 10 CFR part 1021. This rule will not affect the quality or distribution of energy usage and therefore will not result in any environmental impacts. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, “Federalism,” 64 FR 43255 (Aug. 4, 1999), imposes certain requirements on Federal agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR at 13735. DOE has examined this proposed rule and has determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the equipment that is the subject of today’s proposed rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, “Civil Justice Reform,” 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide

a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, the proposed rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA; Pub.104–4) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. For proposed regulatory actions likely to result in a rule that may cause expenditures by State, local, and Tribal governments in the aggregate or by the private sector of \$100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish estimates of the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a),(b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed “significant intergovernmental mandate” and requires an

agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR at 12820. (This policy is also available at <http://energy.gov/gc/office-general-counsel>.) DOE reviewed today's proposed rule pursuant to UMRA and its policy, and DOE determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure of \$100 million or more in any year. Accordingly, no further assessment or analysis is required under UMRA.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

Pursuant to Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights," 53 FR 8859 (March 15, 1988), DOE has determined that this proposed regulation, if promulgated as a final rule, would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under the Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516, note) provides for Federal agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. The OMB's guidelines were published in 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published in 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's proposed rule under the OMB and DOE guidelines, and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OIRA, Office of Management and Budget, a Statement of Energy Effects for any proposed significant energy action. A "significant energy action" is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

This regulatory action to amend the test procedure for refrigerated bottled or canned beverage vending machines is not a significant regulatory action under Executive Order 12866 or any successor order. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects for this rulemaking.

L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95-91), DOE must comply with section 32 of the Federal Energy Administration Act of 1974 (Pub. L. 93-275), as amended by the Federal Energy Administration Authorization Act of 1977 (Pub. L. 95-70). Section 32 provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. (15 U.S.C. 788 section 32) In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission (FTC) concerning the impact of the commercial or industry standards on competition.

This proposed rule incorporates testing methods contained in the following commercial standard: ANSI/ASHRAE Standard 32.1-2010, “Methods of Testing for Rating Vending Machines for Sealed Beverages.” DOE has evaluated this standard and is unable to conclude whether it fully complies with the requirements of section 32(b) of the Federal Energy Administration Act (i.e., whether they were developed in a manner that fully provides for public participation, comment, and review).

As required by section 32(c) of the Federal Energy Administration Act of 1974 as amended, DOE will consult with the Attorney General and the Chairman of the Federal Trade Commission about the impact on competition of requiring manufacturers to use the test methods contained in this standard prior to prescribing a final rule.

V. Public Participation

A. Attendance at Public Meeting

The time, date, and location of the public meeting are listed in the **DATES** and **ADDRESSES** sections at the beginning of this document. If you plan to attend the public meeting, please notify Ms. Brenda Edwards at (202) 586-2945 or Brenda.Edwards@ee.doe.gov.

Please note that foreign nationals visiting DOE Headquarters are subject to advance security screening procedures. Any foreign national wishing to participate in the meeting should advise DOE as soon as possible by contacting Ms. Edwards to initiate the necessary procedures. Please also note that those wishing to bring laptops into the Forrestal Building will be required to obtain a property pass. Visitors should avoid bringing laptops, or allow an extra 45 minutes.

In addition, you can attend the public meeting via webinar. Webinar registration information, participant instructions, and information about the capabilities available to webinar participants will be published on DOE's website

http://www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx/ruleid/73.

Participants are responsible for ensuring their systems are compatible with the webinar software.

B. Procedure for Submitting Prepared General Statements for Distribution

Any person who has plans to present a prepared general statement may request that copies of his or her statement be made available at the public meeting. Such persons may submit requests, along with an advance electronic copy of their statement in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format, to the appropriate address shown in the **ADDRESSES** section at the beginning of this NOPR. The request and advance copy of statements must be received at least one week before the public meeting and may be emailed, hand-delivered, or sent by mail. DOE prefers to receive requests and advance copies via email. Please include a telephone number to enable DOE staff to make a follow-up contact, if needed.

C. Conduct of the Public Meeting

DOE will designate a DOE official to preside at the public meeting and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA (42 U.S.C. 6306). A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing the conduct of the public meeting. After the public meeting and until the end of the comment period, interested parties may submit further comments on the proceedings and any aspect of the rulemaking.

The public meeting will be conducted in an informal, conference style. DOE will present summaries of comments received before the public meeting, allow time for prepared general statements by participants, and encourage all interested parties to share their views on issues affecting this rulemaking. Each participant will be allowed to make a general statement (within time limits determined by DOE), before the discussion of specific topics. DOE will allow, as time permits, other participants to comment briefly on any general statements.

At the end of all prepared statements on a topic, DOE will permit participants to clarify their statements briefly and comment on statements made by others. Participants should be prepared to answer questions by DOE and by other participants concerning these issues. DOE representatives may also ask questions of participants concerning other matters relevant to this rulemaking. The official conducting the public meeting will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the public meeting.

A transcript of the public meeting will be included in the docket, which can be viewed as described in the Docket section at the beginning of this NOPR. In addition, any person may buy a copy of the transcript from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule before or after the public meeting, but no later than the date provided in the **DATES** section at the

beginning of this proposed rule. Interested parties may submit comments using any of the methods described in the **ADDRESSES** section at the beginning of this NOPR.

Any comments submitted must identify the NOPR for the test procedure for refrigerated beverage vending machines and provide docket number EE-2013-BT-TP-0045 and/or regulatory information number (RIN) number 1904-AD07.

Submitting comments via [regulations.gov](http://www.regulations.gov). The [regulations.gov](http://www.regulations.gov) web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to regulations.gov information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (CBI)). Comments submitted through regulations.gov cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through regulations.gov before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that regulations.gov provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery, or mail. Comments and documents submitted via email, hand delivery, or mail also will be posted to regulations.gov. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information in a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via mail or hand delivery, please provide all items on a CD, if feasible. It is not necessary to submit printed copies. No facsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked non-confidential with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items; (2) whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known by or available from other sources; (4) whether the information has previously been made available to others without obligation concerning its confidentiality; (5) an explanation of the competitive injury to the submitting person which would result from public disclosure; (6) when such information might lose its confidential character due to the passage of time; and (7) why disclosure of the information would be contrary to the public interest.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

E. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

- 1) DOE requests comment on the proposal to update its test procedure to incorporate by reference ANSI/ASHRAE Standard 32.1-2010.
- 2) DOE requests comment on its proposal to update the referenced method of test for the measurement of refrigerated volume in its test procedure from section 5 of ANSI/AHAM HRF-1-2004 to Appendix C of ANSI/ASHRAE 3.1-2010.

- 3) DOE requests comment on whether the methodology in Appendix C of ANSI/ASHRAE Standard 32.1-2010 for the measurement of refrigerated volume is more appropriate for beverage vending machines than the methodology outlined in section 4 of AHAM HRF-1-2008.
- 4) DOE requests comment on its proposal to eliminate the requirement to conduct testing at the 90 °F ambient test condition.
- 5) DOE requests comment on the applicability of the existing test procedure, as clarified, to combination vending machines.
- 6) DOE proposes to add language to the DOE test procedure in Appendix A and Appendix B to clarify the loading requirements for covered BVM models.
- 7) DOE requests comment on the proposed clarification that the standard product shall be 12-ounce cans or 20-ounce bottles, for BVM models that are capable of holding cans or bottles, respectively, filled with a liquid with a density of $1.0 \text{ g/mL} \pm 0.1 \text{ g/mL}$ at 36 °F.
- 8) DOE requests comment on the need to maintain the flexibility of specifying the standard product as that specified by the manufacturer for refrigerated bottled or canned beverage vending machines that are not capable of holding 12-ounce cans or 20-ounce bottles. DOE specifically requests examples of BVM models that might require this flexibility and what type of standard products they are tested with currently.
- 9) DOE requests comment on the sufficiency of the existing requirements regarding standard test packages. If the existing language is not sufficiently clear, DOE requests

- comments and recommendations regarding what additional clarifications might be necessary to ensure consistency and repeatability of test results.
- 10) DOE also requests comment on its proposed definition of “integrated average temperature” for beverage vending machines.
- 11) DOE requests comment on whether the proposed definition for “integrated average temperature” aligns with standard practice in industry, and whether any manufacturers have been maintaining the 36 °F (± 1 °F) next-to-vend temperature constantly throughout the test used for DOE certification.
- 12) DOE requests comment on its proposed definition of “fully cooled.” DOE would appreciate comment as to whether the proposed definition aligns with the classifications of Class A and Class B equipment used in industry.
- 13) DOE requests comment on the proposed fully cooled validation test method.
- Specifically, DOE requests comment as to whether 10 °F is an appropriate threshold to differentiate fully cooled equipment and any incremental burden on manufacturers associated with the optional test method for determining if a BVM model meets the definition of “fully cooled.”
- 14) DOE requests comment on its proposal to adopt a lowest application product temperature provision for covered beverage vending machines that cannot be tested at the specified average next-to-vend temperature of 36 °F (± 1 °F).
- 15) DOE also requests comment on how the lowest application product temperature might be best determined for beverage vending machines and whether the lowest thermostat setting is a reasonable approach for most equipment. DOE requests

- comment on how to determine the lowest application product temperature for equipment without thermostats.
- 16) DOE requests comment on its proposal to allow covered equipment that cannot maintain the 36 °F (± 1 °F) average next-to-vend temperature to be tested at the lowest application product temperature without requesting a DOE waiver.
- 17) DOE requests comment on its proposal to clarify in Appendix A and B that internal lighting shall be operated in the maximum energy consuming state under the DOE test procedure.
- 18) DOE requests comment on whether the maximum energy consuming state for internal lighting is consistent with “normal” operation.
- 19) DOE requests comment on the range of equipment that should be addressed in this category of accessories and if the proposed terminology of customer display signs, lighting, and digital screens is sufficient to capture the variety of similar auxiliary energy-consuming accessories that might be installed on BVM models.
- 20) DOE requests comment on the treatment of external and integral customer display signs, lighting, and digital screens in Appendix A..
- 21) DOE requests comment on the proposed treatment of external and integral customer display signs, lighting, and digital screens in Appendix B. Specifically, DOE requests comment on whether disabling external devices and placing integral devices in standby mode or their lowest energy-consuming state is sufficiently representative of the energy use of refrigerated bottled or canned beverage vending machines.
- 22) DOE requests comment on the proposed definition of standby mode as the mode of operation in which the external, integral customer display signs, lighting, or digital

- screens is connected to mains power, does not produce the intended illumination, display, or interaction functionality, and can be switched into another mode automatically with only a remote user-generated or an internal signal.
- 23) For digital screens that also perform the vending or money-processing function, DOE requests comment on the proposal to place these screens in their lowest energy-consuming state that still allows the money-processing feature to function.
- 24) DOE requests comment on its proposal to clarify the treatment of accessories in the DOE test procedure.
- 25) DOE also requests comment on any other accessories that may require special treatment or exemption.
- 26) DOE requests comment on its proposed definitions of “low power mode,” “refrigeration low power mode,” and “accessory low power mode.”
- 27) DOE requests comment on its proposal that units run at the most energy-consuming lighting and control settings, except as specified in section III.A.11, during the BVM test procedure, except for during the 6-hour low power mode test period.
- 28) DOE requests comment on its proposal to require, as part of the test procedure, whatever stimuli are necessary to prevent automatic activation of low power modes during the vending state test procedure.
- 29) DOE requests comment on its proposed method for accounting for equipment that can use low power modes. DOE requests comment as to whether this proposed method reflects typical field use.
- 30) DOE requests comment on whether 6 hours is an appropriate length of time for the low power mode test period.

- 31) DOE requests information on the prevalence of non-cycling (variable-speed) compressors in the BVM industry.
- 32) DOE requests comment on whether a credit equal to 3 percent of the measured DEC is reflective of the 6 hours of time in refrigeration low power mode.
- 33) DOE requests comment on the refrigeration low power mode validation test and, particularly, if a one hour time period in which the instantaneous average of all standard test packages in the next-to-vend beverage position is maintained above 40 °F is appropriate to verify the performance of refrigeration low power modes.
- 34) DOE requests comment on whether a physical test method would be a more representative and accurate method to account for low power mode operation, including refrigeration low -power mode.
- 35) DOE requests comment on its certification that the proposed test procedure changes will not have a significant impact on a substantial number of small entities.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this proposed rule.

List of Subjects

10 CFR Part 429

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Reporting and recordkeeping requirements.

10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, Reporting and recordkeeping requirements.

Issued in Washington, DC, on August 1, 2014.

Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

For the reasons set forth in the preamble, DOE is proposing to amend parts 429 and 431 of chapter II of title 10, of the Code of Federal Regulations, as set forth below:

**PART 429 – CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR
CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT**

1. The authority citation for part 429 continues to read as follows:

Authority: 42 U.S.C. 6291–6317.

2. Section 429.52 is amended by revising paragraph (b)(2) to read as follows:

§ 429.52 Refrigerated bottled or canned beverage vending machines.

* * * * *

(b) * * *

(2) Pursuant to §429.12(b)(13), a certification report shall include the following additional product-specific information: When using Appendix A of this part, the daily energy consumption in kilowatt hours per day (kWh/day), the refrigerated volume (V) in cubic feet (ft³), and the lowest application product temperature, if applicable. When using Appendix B, the daily energy consumption in kilowatt hours per day (kWh/day), the refrigerated volume (V) in cubic feet (ft³), whether testing was conducted using an accessory low power mode, whether testing was conducted using a refrigeration low power mode, and, if applicable, the lowest application product temperature.

PART 431 – ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

3. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291–6317.

4. Section 431.291 is revised to read as follows:

§ 431.291 Scope.

This subpart specifies test procedures and energy conservation standards for certain commercial refrigerated bottled or canned beverage vending machines, pursuant to part A of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291-6309. The regulatory provisions of §§ 430.33 and 430.34 and subparts D and E of 10 CFR part 430 of this chapter are applicable to refrigerated bottled or canned beverage vending machines.

5. Section 431.292 is amended by adding in alphabetical order the definitions for “Fully cooled,” “Integrated average temperature,” and “Lowest application product temperature,” to read as follows:

§ 431.292 Definitions concerning refrigerated bottled or canned beverage vending machines.

* * * * *

Fully cooled means a condition in which the refrigeration system of a beverage vending machine cools product throughout the entire refrigerated volume of a machine instead of being directed at a fraction (or zone) of the refrigerated volume as measured by the average temperature of the standard test packages in the furthest from the next-to-vend positions being no more than 10 °F above the integrated average temperature of the standard test packages.

Integrated average temperature means the average temperature of all standard test package measurements in the next-to-vend beverage positions taken during the test, expressed in degrees Fahrenheit (°F).

Lowest application product temperature means the lowest integrated average temperature a given basic model is capable of maintaining so as to comply with the temperature stabilization requirements specified in section 7.2.2.2 of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293).

* * * * *

6. Section 431.293 is amended by revising paragraph (b)(1) and removing and reserving paragraph (b)(2).

The revision reads as follows:

§ 431.293 Materials incorporated by reference.

* * * * *

(b) * * *

(1) ANSI/ASHRAE Standard 32.1-2010, (“ANSI/ASHRAE 32.1”), “Methods of Testing for Rating Vending Machines for Sealed Beverages,” approved June 26, 2010, IBR approved for appendices A and B to subpart Q.

* * * * *

7. Section 431.294 is amended by revising paragraph (b) to read as follows:

§431.294 Uniform test method for the measurement of energy consumption of refrigerated bottled or canned beverage vending machines.

* * * * *

(b) Testing and calculations. Determine the daily energy consumption of each covered refrigerated bottled or canned beverage vending machine by conducting the appropriate test procedure set forth in appendix A or B to this subpart.

§431.296 [Amended]

8. Section 431.296 is amended by removing the word “maximum” after “shall have a” in the introductory text

9. Subpart Q of part 431 is amended by adding appendices A and B to read as follows:

APPENDIX A TO SUBPART Q OF PART 431 -- UNIFORM TEST METHOD FOR THE MEASUREMENT OF ENERGY CONSUMPTION OF REFRIGERATED BOTTLED OR CANNED BEVERAGE VENDING MACHINES.

Note: After [date 30 days after publication of the final rule in the federal register] and prior to [date 180 days after publication of the final rule in the federal register], manufacturers must make any representations with respect to the energy use or efficiency of refrigerated bottled or canned beverage vending machines in accordance with the results of testing pursuant to this Appendix A or the procedures in 10 CFR 431.294 as it appeared in the 10 CFR parts 200 to 499 edition revised as of January 1, 2014. After [date 180 days after date of publication of the final rule], manufacturers must make any representations with respect to energy use or efficiency in accordance with the results of testing pursuant to this appendix to demonstrate compliance with the energy conservation standards at 10 CFR 431.296, for which compliance was required as of August 31, 2012.

1. *General.* Section 3, “Definitons,” and section 4, “Instruments,” of ANSI/ASHRAE 32.1 (incorporated by reference; see §431.293) apply to this appendix. In cases where there is a conflict, the language of the test procedure in this appendix takes precedence over ANSI/ASHRAE 32.1.

2. Test Procedure.

2.1. Test Conditions.

2.1.1. Equipment Loading. Configure refrigerated bottled or canned beverage vending machines to hold the maximum number of standard products and place a standard test package in each next-to-vend position.

2.1.1.1. Standard Products. The standard product shall be standard 12-ounce aluminum beverage cans filled with a liquid with a density of 1.0 grams per milliliter (g/mL) \pm 0.1 g/mL at 36 °F. For product storage racks that are not capable of holding 12-ounce cans, but are capable of holding 20-ounce bottles, the standard product shall be 20-ounce plastic bottles filled with a liquid with a density of 1.0 g/mL \pm 0.1 g/mL at 36 °F. For product storage racks that are not capable of holding 12-ounce cans or 20-ounce bottles, the standard product shall be the packaging and contents specified by the manufacturer as the standard product (i.e., the specific merchandise the refrigerated bottled or canned beverage vending machine is designed to vend).

2.1.1.2. Standard Test Packages. A standard test package is a standard product, as specified in 2.1.1.1, altered to include a temperature-measuring instrument at its center of mass.

2.1.2. Average Beverage Temperature. The integrated average temperature measured during the test must be within ± 1 °F of the average beverage temperature specified in section 6.1 of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293) (i.e., 36 °F) or the lowest

application product temperature for models tested in accordance with paragraph 2.1.4 of this appendix.

2.1.3. *Ambient Test Conditions.* Test the refrigerated bottled or canned beverage vending machine at the test condition of $75\text{ }^{\circ}\text{F} \pm 2\text{ }^{\circ}\text{F}$ ($23.9\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$) ambient temperature and 45 percent ± 5 percent relative humidity.

2.1.4. *Lowest Application Product Temperature.* If a refrigerated bottled or canned beverage vending machine is not capable of maintaining an integrated average temperature of $36\text{ }^{\circ}\text{F}$ ($\pm 1\text{ }^{\circ}\text{F}$), the unit must be tested at the lowest application product temperature, as defined in §431.292. For refrigerated bottled or canned beverage vending machines equipped with a thermostat, the lowest application product temperature is the integrated average temperature achieved at the lowest thermostat setting.

2.2. *Determination of Daily Energy Consumption.* Except as provided in this appendix, the test procedure for energy consumption of refrigerated bottled or canned beverage vending machines shall be conducted in accordance with the methods specified in section 6, “Test Conditions;” and sections 7.1 through 7.2.3.2 under “Test Procedures” of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293).

2.2.1. *Temperature Measurement.* The integrated average temperature of next-to-vend beverages shall be measured in a standard test packages in each next-to-vend position for each selection, as specified in section 7.2.2.1 of ANSI/ASHRAE 32.1 (incorporated by reference, see

§431.293). Do not run thermocouple wire and other measurement apparatus through the dispensing door; thermocouple wire and other measurement apparatus may be run through the gasket, provided that the gasket is fully compressed around the intruding wire and sealed to minimize air flow between the interior refrigerated volume and the ambient room air.

2.2.2. *Accessories.* All standard components that would be used during normal operation of the model in the field shall be in place during testing and shall be set to the maximum energy-consuming setting if manually adjustable, except that the specific components and accessories listed in the subsequent sections shall be operated as stated. Instead of testing pursuant to section 7.2.2.4 of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293), provide, if necessary, any physical stimuli or other input to the machine needed to prevent automatic activation of energy management systems that can be adjusted by the machine operator during the test period. Automatic energy management systems that cannot be adjusted by the machine operator may be enabled, as specified by section 7.2.1 of ANSI/ASHRAE 32.1.

2.2.2.1 *Money-Processing Devices.* Money-processing devices must be in place and functional during testing.

2.2.2.2. *Internal Lighting.* All lighting that is contained within or is part of the internal physical boundary of the refrigerated bottled or canned beverage vending machine, as established by the top, bottom, and side panels of the equipment, shall be placed in its maximum energy consuming state.

2.2.2.3. External Customer Display Signs, Lighting, and Digital Screens. All external customer display signs, lighting, and digital screens that are independent from the refrigeration or vending performance of the refrigerated bottled or canned beverage vending machine must be disconnected, disabled, or otherwise de-energized for the duration of testing. Customer display signs, lighting, and digital screens that are integrated into the BVM cabinet or controls such that they cannot be de-energized without disabling the refrigeration or vending functions of the refrigerated bottled or canned beverage vending machine or modifying the circuitry must be placed in their lowest energy-consuming state. This includes television displays and other supplemental lighting that exists for advertising or display purposes. Digital displays that also serve a vending or money-processing function must be placed in the lowest energy-consuming state that still allows the money-processing feature to function.

2.2.2.4. Anti-sweat and Other Electric Resistance Heaters. Anti-sweat and other electric resistance heaters must be operational during the entirety of the test procedure. Models with a user-selectable setting must have the heaters energized and set to the maximum usage position. Models featuring an automatic, non-user-adjustable controller that turns on or off based on environmental conditions must be operating in the automatic state.

2.2.2.5. Condensate Pan Heaters and Pumps. All electric resistance condensate heaters and condensate pumps must be installed and operational during the test. Prior to the start of the stabilization period, as defined by ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293), the condensate pan must be dry. Following the start of the stabilization period, allow

any condensate moisture generated to accumulate in the pan. Do not manually add or remove water from the condensate pan at any time during the test.

2.2.2.6. *Illuminated Temperature Displays.* All illuminated temperature displays shall be energized and operated during the test as they would be during normal field operation.

2.2.2.7. *Condenser Filters.* Remove any nonpermanent filters provided to prevent particulates from blocking a model's condenser coil.

2.2.2.8. *Security Covers.* Remove any devices used to secure the model from theft or tampering.

2.2.2.9. *General Purpose Outlets.* During the test, do not connect any external load to any general purpose outlets available on a unit.

2.2.2.10. *Crankcase Heaters and Other Electric Resistance Heaters for Cold Weather.* Crankcase heaters and other electric resistance heaters for cold weather must be operational during the test. If a control system, such as a thermostat or electronic controller, is used to modulate the operation of the heater, it must be activated during the test.

3. *Determination of Refrigerated Volume and Vendible Capacity.*

3.1. Determine “refrigerated volume” of refrigerated bottled or canned beverage vending machines in accordance with Appendix C, “Measurement of Volume,” of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293). For combination vending machines, the “refrigerated volume” is only that portion of the refrigerated bottled or canned beverage vending machine that is actively refrigerated.

3.2. Determine “vendible capacity” of refrigerated bottled or canned beverage vending machines in accordance with the first paragraph of section 5, “Vending Machine Capacity,” of ANSI/ASHRAE 32.1, (incorporated by reference, see §431.293). For combination vending machines, the “vendible capacity” is the entire volume from which product may be vended, whether or not that volume is refrigerated.

4. Verification of Fully Cooled Refrigerated Bottled or Canned Beverage Vending Machines.

To determine if a refrigerated bottled or canned beverage vending machine model is fully cooled, install standard test packages in the furthest from the next-to-vend positions. For a beverage vending machine with horizontal product rows, or spirals, this would require a standard test package at the back of the horizontal product rows in the four corners of the machine (e.g., bottom right, bottom left, top right, and top left). For a beverage vending machine with standard products configured in a vertical stack, this would require a standard test package at the top of each stack. Calculate the average temperature of all the standard test packages in the furthest from the next-to-vend position over the entire test period. Subtract this value from the integrated

average temperature of standard test packages in the next-to-vend beverage positions. If the difference between these two values is less than or equal to 10 °F, the tested unit is fully cooled.

APPENDIX B TO SUBPART Q OF PART 431 –UNIFORM TEST METHOD FOR THE MEASUREMENT OF ENERGY CONSUMPTION OF REFRIGERATED BOTTLED OR CANNED BEVERAGE VENDING MACHINES.

Note: After **[date 30 days after publication of the final rule in the federal register]** and prior to **[date 180 days after publication of the final rule in the federal register]**, manufacturers must make any representations with respect to the energy use or efficiency of refrigerated bottled or canned beverage vending machines in accordance with the results of testing pursuant to Appendix A or the procedures in 10 CFR 431.294 as it appeared in the 10 CFR parts 200 to 499 edition revised as of January 1, 2014. After **[date 180 days after date of publication of the final rule]**, manufacturers must make any representations with respect to energy use or efficiency in accordance with the results of testing pursuant to Appendix A of this Subpart to demonstrate compliance with the energy conservation standards at 10 CFR 431.296, for which compliance was required as of August 31, 2012.

Alternatively, manufacturers may make representations based on testing in accordance with this appendix prior to the compliance date of any amended energy conservation standards, provided that such representations demonstrate compliance with such amended energy conservation standards. Any representations made on or after the compliance date of any amended energy conservation standards, must be made in accordance with the results of testing pursuant to Appendix B.

1. *General.*

1.1 In cases where there is a conflict, the language of the test procedure in this appendix takes precedence over ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293).

1.2. *Definitions.* Section 3, “Definitions,” and section 4, “Instruments,” of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293) apply to this appendix.

Accessory low power mode means a state in which a beverage vending machine’s lighting and/or other energy-using systems, except the refrigeration system, are in low power mode. This may include, but is not limited to, dimming or turning off lights but does not include adjustment of the refrigeration system.

Low power mode means a state in which a beverage vending machine’s lighting, refrigeration, and/or other energy-using systems are automatically adjusted (without user intervention) such that they consume less energy than they consume in an active vending environment.

Refrigeration low power mode means a state in which a beverage vending machine’s refrigeration system is in low power mode. To qualify as low power mode, the average next-to-vend temperature must automatically (without user intervention) rise to at least 4 °F above the integrated average temperature or lowest application product temperature, as applicable, and remain above this threshold for at least one hour.

Standby mode means the mode of operation in which any external, integral customer display signs, lighting, or digital screens are connected to mains power; do not produce the

intended illumination, display, or interaction functionality; and can be switched into another mode automatically with only a remote user-generated or an internal signal.

2. Test Procedure.

2.1. Test Conditions.

2.1.1. Equipment Loading. Configure refrigerated bottled or canned beverage vending machines to hold the maximum number of standard products, and place a standard test package in each next-to-vend position. For combination vending machines, only load the refrigerated volume with standard test packages.

2.1.1.1. Standard Products. The standard product shall be standard 12-ounce aluminum beverage cans filled with a liquid with a density of 1.0 grams per milliliter (g/mL) \pm 0.1 g/mL at 36 °F. For product storage racks that are not capable of holding 12-ounce cans, but are capable of holding 20-ounce bottles, the standard product shall be 20-ounce plastic bottles filled with a liquid with a density of 1.0 g/mL \pm 0.1 g/mL at 36 °F. For product storage racks that are not capable of holding 12-ounce cans or 20-ounce bottles, the standard product shall be the packaging and contents specified by the manufacturer as the standard product (i.e., the specific merchandise the refrigerated bottled or canned beverage vending machine is designed to vend).

2.1.1.2. *Standard Test Packages.* A standard test package is a standard product, as specified in 2.1.1.1, altered to include a temperature-measuring instrument at its center of mass.

2.1.2. *Average Beverage Temperature.* The integrated average temperature measured during the vending state test period must be within ± 1 °F of the average beverage temperature specified in section 6.1 of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293) (i.e., 36 °F) or the lowest application product temperature for models tested in accordance with paragraph 2.1.4 of this appendix).

2.1.3. *Ambient Test Conditions.* Test the refrigerated bottled or canned beverage vending machine at the test condition of $75\text{ °F} \pm 2\text{ °F}$ ($23.9\text{ °C} \pm 1\text{ °C}$) ambient temperature and 45 percent ± 5 percent relative humidity.

2.1.4. *Lowest Application Product Temperature.* If a refrigerated bottled or canned beverage vending machine is not capable of maintaining an integrated average temperature of 36 °F (± 1 °F), the unit must be tested at the lowest application product temperature, as defined in §431.292. For refrigerated bottled or canned beverage vending machines equipped with a thermostat, the lowest application product temperature is the integrated average temperature achieved at the lowest thermostat setting.

2.2. *Determination of Daily Energy Consumption.* Except as provided in this appendix, the test procedure for energy consumption of refrigerated bottled or canned beverage vending

machines shall be conducted in accordance with the test procedures specified in section 6, “Test Conditions;” and sections 7.1 through 7.2.3.2 under “Test Procedures,” of ANSI/ASHRAE 32.1, “Methods of Testing for Rating Vending Machines Sealed Beverages” (incorporated by reference, see §431.293). In section 7.2.3.1 of ANSI/ASHRAE 32.1, the energy consumed during the test (E_T) shall be the energy measured during the vending mode test period and accessory low power mode test period, as specified in section 2.2.2 and 2.2.3, as applicable.

2.2.1. Temperature Measurement. The integrated average temperature of next-to-vend beverages shall be measured in a standard test packages in each next-to-vend position for each selection, as specified in section 7.2.2.1 of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293). Do not run thermocouple wire and other measurement apparatus through the dispensing door; thermocouple wire and other measurement apparatus may be run through the gasket such that the gasket is fully compressed around the intruding wire and sealed to minimize air flow between the interior refrigerated volume and the ambient room air.

2.2.2. Vending Mode Test Period. The vending mode test period begins immediately following the stabilization period and continues for 18 hours for equipment with an accessory low power mode or for 24 hours for equipment without an accessory low power mode. For the vending mode test period, equipment that has energy-saving features that cannot be disabled shall be set to the most energy-consuming settings, except for as specified in paragraph 2.2.4. In addition, all energy management systems shall be disabled. Instead of testing pursuant to sections 7.1.1(d) and 7.2.2.4 of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293),

provide, if necessary, any physical stimuli or other input to the machine needed to prevent automatic activation of low power modes during the vending mode test period.

2.2.3. Accessory Low Power Mode Test Period. For equipment with an accessory low power mode the accessory low power mode may be engaged for 6 hours, beginning 18 hours after the temperature stabilization requirements established in ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293) have been met, and continuing until the end of the 24-hour test period. During the accessory low power mode test, operate the refrigerated bottled or canned beverage vending machine with the lowest energy-consuming lighting and control settings that constitute an accessory low power mode. The specification and tolerances for average beverage temperature in section 6.1 of ANSI/ASHRAE 32.1 still apply, and any refrigeration low power mode must not be engaged. Instead of testing pursuant to sections 7.1.1(d) and 7.2.2.4 of ANSI/ASHRAE 32.1, provide, if necessary, any physical stimuli or other input to the machine needed to prevent automatic activation of refrigeration low power modes during the vending mode test period.

2.2.3.1. Refrigeration Low Power Mode. For refrigerated bottled or canned beverage vending machines with a refrigeration low power mode multiply the primary rated energy consumption per day (\underline{E}_T) by 0.97 to determine the daily energy consumption of the unit tested.

2.2.4. Accessories. Unless specified otherwise in this appendix, all standard components that would be used during normal operation of the basic model in the field shall be in place during testing and shall be set to the maximum energy-consuming setting if manually adjustable.

Components with controls that are permanently operational and cannot be adjusted by the machine operator shall be operated in their normal setting and consistent with the requirements of 2.2.2 and 2.2.3 of this appendix. The specific components and accessories listed in the subsequent sections shall be operated as stated during the test, except when controlled as part of a low power mode during the low power mode test period.

2.2.4.1 Money-Processing Devices. Money-processing devices must be in place and functional during testing.

2.2.4.2. Internal Lighting. All lighting that is contained within or is part of the internal physical boundary of the refrigerated bottled or canned beverage vending machine, as established by the top, bottom, and side panels of the equipment, shall be placed in its maximum energy consuming state.

2.2.4.3. External Customer Display Signs, Lights, and Digital Screens. All external customer display signs, lighting, and digital screens that are independent from the refrigeration or vending performance of the refrigerated bottled or canned beverage vending machine must be disconnected, disabled, or otherwise de-energized for the duration of testing. Customer display signs, lighting, and digital screens that are integrated into the beverage vending machine cabinet or controls such that they cannot be de-energized without disabling the refrigeration or vending functions of the refrigerated bottled or canned beverage vending machine or modifying the circuitry must be placed in standby mode, if available, or their lowest energy-consuming state. This includes television displays and other supplemental lighting that exists for advertising or

display purposes. Digital displays that also serve a vending or money-processing function must be placed in the lowest energy-consuming state that still allows the money-processing feature to function.

2.2.4.4. Anti-sweat or Other Electric Resistance Heaters. Anti-sweat or other electric resistance heaters must be operational during the entirety of the test procedure. Models with a user-selectable setting must have the heaters energized and set to the maximum usage position. Models featuring an automatic, non-user-adjustable controller that turns on or off based on environmental conditions must be operating in the automatic state.

2.2.4.5. Condensate Pan Heaters and Pumps. All electric resistance condensate heaters and condensate pumps must be installed and operational during the test. Prior to the start of the stabilization period, as defined by ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293), the condensate pan must be dry. Following the start of the stabilization period, allow any condensate moisture generated to accumulate in the pan. Do not manually add or remove water from the condensate pan at any time during the test. Any automatic controls that initiate the operation of the condensate pan heater or pump based on water level or ambient conditions must be enabled and operated in the automatic setting.

2.2.4.6. Illuminated Temperature Displays. All illuminated temperature displays shall be energized and operated during the test as they would be during normal field operation.

2.2.4.7. *Condenser Filters*. Remove any nonpermanent filters provided to prevent particulates from blocking a model's condenser coil.

2.2.4.8. *Security Covers*. Remove any devices used to secure the model from theft or tampering.

2.2.4.9. *General Purpose Outlets*. During the test, do not connect any external load to any general purpose outlets available on a unit.

2.2.4.10. *Crankcase Heaters and Other Electric Resistance Heaters for Cold Weather*. Crankcase heaters and other electric resistance heaters for cold weather must be operational during the test. If a control system, such as a thermostat or electronic controller, is used to modulate the operation of the heater, it must be activated during the test.

3. *Determination of Refrigeration Volume and Vendible Capacity.*

3.1. Determine "refrigerated volume" of refrigerated bottled or canned beverage vending machines in accordance with Appendix C, "Measurement of Volume," of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293). For combination vending machines, the "refrigerated volume" is only that portion of the refrigerated bottled or canned beverage vending machine that is actively refrigerated.

3.2. Determine “vendible capacity” of refrigerated bottled or canned beverage vending machines in accordance with the first paragraph of section 5, “Vending Machine Capacity,” of ANSI/ASHRAE 32.1 (incorporated by reference, see §431.293). For combination vending machines, the “vendible capacity” is the entire volume from which product may be vended, whether or not that volume is actively refrigerated.

4. Verification Tests.

These test methods are not required for the certification of refrigerated bottled or canned beverage vending machines.

4.1 Verification of Fully Cooled Refrigerated Bottled or Canned Beverage Vending Machines. To determine if a refrigerated bottled or canned beverage vending machine model is fully cooled, install standard test packages in the furthest from the next-to-vend positions. For a beverage vending machine with horizontal product rows, or spirals, this would require a standard test package at the back of the horizontal product rows in the four corners of the machine (e.g., bottom right, bottom left, top right, and top left). For a beverage vending machines with standard products configured in a vertical stack, this would require a standard test package at the top of each stack. Calculate the average temperature of all the standard test packages in the furthest from the next-to-vend position over the entire test period and subtract this value from the integrated average temperature of standard test packages in the next-to-vend beverage positions.

If the difference between these two values is less than or equal to 10 °F, the tested unit is fully cooled.

4.2 Refrigeration Low Power Mode Validation Test Method. To verify the existence of a refrigeration low power mode initiate the refrigeration low power mode after completion of the 6-hour low power mode test period and record the average temperature of the standard test packages in the next-to-vend beverage positions for the next 2 hours. Over the course of this 2-hour period, the instantaneous average next-to-vend beverage temperatures, that is the spatial average of all next-to-vend beverages, must increase above 40 °F and remain above 40 °F for at least 1 hour. At the conclusion of the 2-hour refrigeration low power mode verification test period, the refrigerated beverage vending machine must return to 36 ± 1 °F automatically without direct physical intervention. Record the average temperature of the standard test packages in the next-to-vend beverage positions until the average temperature returns to at least 37 °F.³

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